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Overreaction, Seasonality and Relationship Among Middle East and North Africa National Stock Markets

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OVERREACTION, SEASONALITY AND RELATIONSHIP AMONG MIDDLE EAST AND NORTH AFRICA NATIONAL STOCK MARKETS

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ABSTRACT

OVERREACTION, SEASONALITY AND RELATIONSHIP AMONG MIDDLE EAST AND NORTH AFRICA NATIONAL STOCK MARKETS

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This dissertation examines overreaction, seasonality, and relationship among Middle East and North Africa (MENA) stock markets. The dissertation is organized in five chapters. The first chapter is introduction to the dissertation and its importance. The second chapter will discuss the MENA capital market developments in the last few years, examine the human and economic development for countries in MENA, and try to find similarities and differences between them. Then the discussion will shift to an overview of the GCC, Levant, and NA regions. Finally, there will be a discussion about economic reform and development in MENA capital markets.

Then, the third chapter investigates the evidence of winner-loser reversals in the national stock market indices of 12 countries from March 1994 to March 2004. The results indicate the consistent with the prediction of the overreaction hypothesis that national indices reversals occur after the formation period similar to the findings of Richards (1995). The reversals phenomenon occurs during the third year of the testing period. This is consistent with other studies and findings that support the overreaction.

The fourth chapter examines the monthly seasonality in 12 MENA national stock markets. The results are mix, we find that Bahrain and Egypt have January effect; however, Bahrain has a negative significant return in January rather positive. In addition, our results show significant Sell-in-May strategy in Morocco and Turkey. However, the

results show some markets contradict both January and the Sell-in-May effects. Bahrain and UAE stock markets have a significant positive return in the summer and a negative return in winter.

Finally, chapter five investigates the existence of linkage among 12 MENA equity indices and regions. Using State Space procedure, the findings indicate that no causality or spillover from one country to another in North Africa region. The results for Levant region reveal that there are linkages between Turkish and Lebanese stock markets while either does not influence Jordan's market. However, GCC region show more interaction and linkage than North Africa and Levant regions. Furthermore, we find that GCC region influences North Africa and Levant region. We contribute the dominance of GCC region to its sheer size relative to the other two regions.

To my mother.

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CHAPTER I

INTRODUCTION

Recent research shows a growing interest in international investment in developing financial markets. Investors are looking for foreign and new emerging markets for diversification in their portfolios, which can be through direct investment or hedge funds. Many fund managers cover Latin America, Eastern Europe, and Far Eastern regions to invest in new emerging markets for diversification and to seek higher returns for their clients. At the same time, fund managers are looking for new customers and new markets that are unexploited. Some new markets that are open for foreign investors are located in the Middle East and North Africa, where many countries have recently been relaxing their laws to catch the attention of foreign investors. At the same time, new local and foreign customers (Muslim investors) are asking for new investments and funds that are according to Islamic Shareiah (Islamic law according to the Holy Qura'an). The objective of this study is to shed some light, through research and study, on Middle Eastern and North African financial markets, in order to help local and foreign investors understand these markets.

The Middle East and North Africa (MENA) have witnessed significant economic and financial development in the last decade, and despite the surge in empirical research, the MENA region, which is composed primarily of Arab League members, is poorly investigated. One reason is the lack of reliable data. Now more data is available for a larger number of countries and for longer periods.

In general, the stock markets in MENA lag well behind many markets in Asia and Latin America; however, some markets developed especially rapidly. In recent years, many Arab countries in MENA have opened exchange markets and issued laws to govern the market or change the law to make it more open for foreign direct investment (FDI). Some countries established new capital markets in just the last two years, like Algeria and Sudan, but they will not be in the study, because of the short time these markets have existed and the lack of information.

We find in MENA three distinct capital market regions that most of the investment firms in the MENA find themselves, as they have some shared quality and uniqueness. They are the Gulf, Levant, and North Africa regions. The countries in the Gulf region, or Gulf Cooperation Council (GCC)[1], are Bahrain, Qatar, Kuwait, Oman, Saudi Arabia, and the United Arab Emirates (UAE). The Levant[2] countries are Jordan, Lebanon and Turkey. In addition, North Africa[3] (NA) countries are Egypt, Morocco and Tunisia. All the sample countries are Arab countries, with the exception of Turkey.

Chapter II will discuss the Middle East and North Africa capital market developments in the last few years. The chapter will examine the human and economic development for countries in MENA and regions around the world. Moreover, we will examine the capital markets for MENA and other regions and try to find similarities and differences between them. Then the focus of discussion will shift to an overview of the

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[1] The Gulf Cooperation Council (GCC) established in 1981 includes six countries, Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates.

[2] The term *Levant* (variously interpreted as deriving from the Latin *levare* (to rise), or the French *levant* (rising) as in 'soleil levant' (rising sun)), refers to the direction of the rising sun, from the perspective of Greek and Roman peoples. As such, it is broadly equivalent to the Arabic term *Mashriq*, 'the land where the sun rises'. Also Levant: collective name for the countries of the eastern shore of the Mediterranean from Egypt to, and including, Turkey.

[3] North Africa is a region generally considered to include: Algeria, Egypt, Libya, Mauritania, Morocco, Sudan, Tunisia, and Western Sahara.

GCC, Levant, and NA regions. Finally, there will be a discussion about economic reform and development in MENA capital markets.

Chapter III investigates the evidence of winner-loser reversals in the national stock market indices of 12 countries from March 1994 to March 2004. In the DeBondt and Thaler (1985) paper, they show overreaction in the US stock market, which holds that if stock prices systematically overshoot as a consequence of excessive investor optimism or pessimism, price reversals should be predictable from past price performance. The question is whether such a phenomenon does continue to hold in MENA national markets, as Richards (1995) finds in his paper using developed economies. Our results indicate the consistent with the prediction of the overreaction hypothesis that national indices reversals occur after the formation period. The reversals phenomenon occurs during the third year of the testing period. This is consistent with other studies and findings that support the overreaction.

Chapter IV examines the seasonality in MENA national markets. Seasonal behavior of the stock market has been documented in several studies in US stock market (Rozeff and Kinney (1976)) and in several international stock markets around the world (Gultekin and Gultekin (1983)). Another seasonal behavior of the stock market occurs in the summer and is called the "Sell-in-May" effect. Studies have documented that returns in the winter months are much larger than returns in summer months (Bouman and Jachbsen 2002 et al.). Chapter IV will investigate the existence of monthly seasonality in 12 stock market indexes in the MENA region. In addition, we examines whether stock returns are significantly high in January, and low during the summer (May-October period). The results are mix, we only find two markets Bahrain and Egypt with January

effect, however, Bahrain has a negative significant return in the month of January rather positive. In addition, our results show significant Sell-in-May strategy in Morocco and Turkey. However, MENA stock markets do not show the same pattern as US and European markets. The results show some markets contradict both January and the Sell-in-May effects. Bahrain and UAE stock markets have a significant positive return in the summer and a negative return in winter.

Chapter V investigates the existence of linkage among MENA equity indices. Economic integration among economies of the world has brought increased attention of investors and academic to study relationship among these markets. While integration in financial markets provides advantages, it also offers potential pitfalls. The October 1987 crash of US financial market led to gloom in financial markets around the world. In addition, in mid-1998 the East Asian crisis became a worldwide financial and economic crisis hitting developing economies. In this chapter, we investigate the existence of relationship between international stock market returns for 12 countries' indexes in MENA region, using daily market returns. Using State Space procedure, the findings indicate that no causality or spillover from one country to another in North Africa region. The results for Levant region reveal that there are linkages between Turkish and Lebanese stock markets while either does not influence Jordan's market. However, GCC region show more interaction and linkage than North Africa and Levant regions. Furthermore, we find that GCC region influences North Africa and Levant region. We contribute the dominance of GCC region to its sheer size relative to the other two regions.

CHAPTER II

MIDDLE EAST AND NORTH AFRICA CAPITAL MARKETS DEVELOPMENTS

II.1. MENA OVERVIEW

Stock markets in the Middle East and North Africa countries have changed drastically over the last few years; privatization programs and new issues of shares have surfaced. However, MENA countries' trade and capital flow remain marginal on a global level. Asian and Latin American markets accounted for the bulk of the international equity inflows, with markets in the MENA regions receiving little inflows.

Many countries in MENA have shown improvements in human and economic development aspects. However, the improvement was not the same in all countries, and not every country improved in all human and economic indicators. Table 2.1 shows the human development indicators for the sample countries, and we added some developed countries and some regions to help us compare between them and find how far they did go. We find that all MENA countries in our sample have improvements in human development indicators. All countries had an increase in per capita income except Kuwait and Saudi Arabia. Both Kuwait and Saudi Arabia had a decline in per capita income from 1995 to 2002; on the other hand, Qatar had the major increase in per capita income, 69 percent, during the same period. By definition, high-income "*economies are those in which 2002 GNI per capita was $9,076 or more*"[4]. The only countries in the

[4] Development Indicators Database, World Bank.

sample that are considered high-income economies are Bahrain, Kuwait, Qatar, and UAE, and all of them are in the Gulf region (GCC).

The improvement was for all countries in literacy rate and life expectancy. Having the highest literacy rate and an above-the-world average are Bahrain, Jordan, Kuwait, Lebanon, Qatar, and Turkey. In 2002, only three countries, Egypt, Morocco and Turkey, had life expectancy of less than 70 years. The public spending on education as a total of GDP is about the same as the rest of the world, with the exception of UAE, Bahrain and Lebanon that had lower spending in 2000, and Saudi Arabia, Tunisia and Morocco that have higher than the world average.

[INSERT TABLE 2.1 HERE]

If we look to regions rather than countries, then we can find some differences between the regions as well. GCC states have the highest per capita income among the regions and NA the lowest. Income in 1995 was highest in UAE, with $17,105, and lowest in Egypt, with $1,034. In 2002, income was highest in Qatar, with $28,140, and lowest in Egypt, with $1,250.

The literacy rate is highest in the Levant region and lowest in the NA region. All countries had improvement from 1995 to 2002. Only Egypt and Morocco had illiteracy rates above 40 percent in 1995 and 2002, but both improved. The GCC region has the highest life expectancy and the NA has the lowest. We note that only Egypt, Turkey, and Morocco had life expectancy less than 70 years in 2002, and in 1995 they had the lowest, about 65 years. The GCC region has a higher life expectancy than MENA, South Asia, and the world average, but not as high as the European Monetary Union (EMU).

Economic development for MENA regions improved, but they need more progress and planning to reach advanced countries. The differences between regions in MENA, as shown by economic indicators, continue to persist. The GCC has a higher number of personal computers, fixed-line phones, Internet users and mobile phones than the Levant and NA. On the other hand, NA has the lowest number of personal computers, fixed-line phones, Internet users and mobile phones. Egypt has the lowest personal computer ratio (only 16.64), Morocco has the lowest Internet users' ratio (only 23.6), and Tunisia has the lowest fixed-line and mobile phones ratio. A note is that Egypt, Morocco and Tunisia, all in the NA region, have ratios well below the world average in personal computers, Internet users, and fixed-line and mobile phones.

[INSERT TABLE 2.2 HERE]

Table 2.3 shows some investment development indications for the sample countries and other developed countries and regions. We note that developed countries have a high market capitalization as a percentage of GDP, such as the UK and US. The MENA countries do not have as a high percentage in market capitalization to GDP as developed countries, and only Bahrain with 89.16, Jordan with 76.23, and Kuwait with 99.24 have a high percentage in 2002. In addition, the lowest market capitalization percentage of GDP is Lebanon with 8.10 and Tunisia with 10.13, in the same year.

Furthermore, developed countries such as the UK, EMU and US have a high level of stocks-traded as percentage of GDP. All of the MENA countries have a low traded-stocks percentage of GDP, with the exception of Kuwait, that had 81.94 in 2002. The

market turnover ratio[5] is low and below the world average (131%) for most of the sample countries, with the exception of Kuwait with 63 and Turkey with 163 percent in 2002.

[INSERT TABLE 2.3 HERE]

From the above we can illustrate that the MENA sample countries are mostly Arab countries, but we find some differences between them in human development factors, and the differences will be shown more by looking to the capital markets for each region.

In economic and financial development, MENA countries have recently witnessed significant development; however, MENA countries' capital flow and trade remain marginal on a global level. Many countries in this region have suffered economic instability, wars, or political turmoil. Wars in the region had the most effect, from the Palestinian-Israeli conflict, to the 1980s Iraqi-Iranian war, to the Kuwait invasion in 1990, to the recent Iraqi war. Indeed, MENA countries have not yet emerged as an economic power and are rarely referred to as influential in the global financial market, other than for oil prices. However, many MENA countries have started to relax some laws to catch the attention of international investors and the FDI. At the same time, many countries have also started privatization programs to transfer state-owned firms to the private sector[6].

[5] Turnover ratio: volume of shares traded as a percentage of total shares listed on an exchange during a period, usually either a day or a year. In this study, I use a year turnover ratio.

[6] Privatization revenue in MENA from 1990 to 2001 ($ millions): Egypt 5,186 – Jordan 1,049 – Kuwait 3,964 – Morocco 5,206 – Tunisia 975 – Others* 1,166 (*includes Algeria, Lebanon, Oman, Qatar, and UAE) source: Arab Monetary Fund.

II.1.B. GCC: AN OVERVIEW

GCC states are mainly oil and gas producing countries. It is a well-established fact that the GCC economies are still oil-dependent; thus, the same goes for the stock markets. Gas and oil resources in the region surged by more than 60 percent between 1997 and 2003, despite a steady increase in supplies. This increase has given regional countries the status of the world's main hydrocarbon suppliers, and experts believe the Arab share of the global market will largely expand in the long term as other supply sources are depleting. Moreover, the larger portion of oil produced is provided by Kuwait, Saudi Arabia and the UAE, which control around 45 percent of the world's total recoverable crude resources. For the past half century, government revenues from oil sales have been the major fuel feeding the economic development for GCC, and as a result, the economic planning was not a major issue. With oil price volatility, many GCC states started to focus on economic planning for future economic growth and managing oil price volatility risks.

With the exception of the Kuwait stock exchange (most active), most of the GCC exchanges are still in their infancy stage. Qatar had formal exchange in 1997 and UAE had its formal exchange in 2000, while Saudi Arabia has no official exchange yet. Bahrain and Oman exchanges have been in operation for a few years. The trading volume is low because the governments still hold a large percent of listed firms that they rarely trade, and on the other hand, strategic shareholders are either major local families or foreign joint ventures (banks in Saudi Arabia). The Kuwaiti government has started to liquidate its holdings with its privatization program.

Most GCC states have similar financial systems, which consist of a central bank, commercial banks, brokering firms, stock exchange and insurance companies. Although Saudi Arabia is the only country in the region without a formal stock market, it has a working plan for organizing a stock market soon.

The market capitalizations of GCC countries are the largest in MENA regions. In 1998, the number of listed companies reached 331, with total market capitalization of $85.2 billion and an annual traded value of $27.6 billion with a turnover of 38.16 percent. By 2003, the capital market in GCC had a major increase: the number of listed companies reached 434 and total market capitalization of six stock markets in the GCC region was around $305.1 billion, with an annual traded value of $220.5 billion and a turnover of 72.29[7] percent.

Economically, GCC countries have strong relationships, so it is wise to expect a relationship among GCC stock markets. Hammoudeh and Aleisa (2004) find daily relationships among stock markets of GCC members, excluding Qatar, from two equilibrium relationships with varying predictive power. They find that he Saudi market leads, followed by Bahrain and the UAE. Kuwait, which is dominated by momentum traders, and Oman have the weakest links with the other GCC markets. And only the Saudi index can predict and be predicted by the New York Mercantile Exchange oil futures prices. Therefore, these markets are candidates for diversified regional portfolios at the country level. Another study by Hassan (2003) for Kuwait, Bahrain, and Oman finds share prices are co-integrated, indicating the existence of a stable, long-term equilibrium relationship between them. Prices in Kuwait and Bahrain are adjusting to a

[7] The increase in market capitalization from 2002 to 2003 was in all GCC markets, but most in Saudi Arabia in terms of value and in Qatar in term of percentage.

long-term equilibrium state, whereas prices in Oman are exogenous and not affected by short-term changes, but are moving along the trend values of each other. Therefore, information on the price levels is helpful for predicting their changes.

Bahrain

The Bahrain Government, in cooperation with the International Finance Corporation (IFC), prepared a feasibility study highlighting the importance of establishing an official stock market in Bahrain. So in 1987 the Bahrain Stock Exchange (BSE) was established, officially commencing operations in 1989 with 29 companies listed on the Exchange. In 1999, the government lifted the restrictions on foreign ownership by allowing GCC nationals to be able to own up to 100 percent of the shares of listed Bahraini companies (up from 49%), giving them full access to the Bahrain market. Likewise, non-GCC nationals are now allowed to own up to 49 percent of a listed company's capital (up from a previous 24%), with the exception of two companies which are subsidized by the government. Furthermore, seven companies are 100 percent open to foreign investors[8].

Kuwait

The Kuwait stock market is the oldest in the GCC region. The first law to organize the stock market in Kuwait was issued in October 1962. It addressed the topic of organizing the issuance of shares and the subscription in them. The 1960s witnessed the establishment of several shareholding companies in various economic activities, yet no law was issued to systemize the trading of the shares of those companies in that decade. However, in 1970 a law was issued concerning the regulation of stock trading in shareholding companies, and in April 1977, the stock exchange was opened and was later

[8] Most information about most markets was obtained from the market web sites.

referred to as the Kuwait Stock Exchange (KSE). In August 1983, the Exchange was reorganized as an independent financial institution.

Trading in KSE was over-the-counter (OTC), but by 1983 the market had shifted to auction trading. Now KSE uses an automated trading system to provide speed and justice in trading that leads to improved competitiveness in the market, trader confidence and transaction volume. In August 1990, trading activities stopped for two years because of the Kuwait invasion (Gulf War) and resumed in September 1992.

In 1994, the Kuwaiti government started to transfer public ownership of shares to the private sector. The Kuwaiti ownership of some companies was not planned, but the government had to maintain market prices from deterioration and to avoid a crash during the Souk-AlManakh crisis in 1982. Therefore, the public ownership objective was to protect private investments. In 1994, the Kuwaiti government started the privatization program by selling the ownership of the listed and unlisted companies. Moreover, since the privatization program started, the prices of many companies and the number of shares traded have increased. The KSE is one of the most dynamic in the world, with a turnover of 127 percent in 1997 and a turnover of 91.94 percent in 2003.

The Al-Saad and Moosa (2005) study investigates the nature of seasonality in the monthly stock returns derived from a general index of the KSE. A structural time series model incorporating stochastic dummies reveals that seasonality is present but is deterministic, as implied by the constancy of the monthly seasonal factors over the sample period. Two conventional models that incorporate deterministic seasonal dummies corroborate these results. Moreover, seasonality is found to take the form of a July effect, as opposed to the better-recognized January effect. This finding is attributed

to the "summer holiday effect." The Al-Qenae, Li, and Wearing (2002) paper investigates the incremental information content of earnings and other macroeconomic variables for share prices within the prices leading earnings framework. They find evidence supporting the phenomenon of prices leading earnings for the KSE, after controlling for basic macroeconomic indicators. The estimated earnings response coefficient is found to be sensitive and significant to the leading periods, and it increased when more leading periods were included. The results suggest that prices anticipate earnings and hence provide useful information to the KSE investors.

Oman

Oman established the Muscat Securities Market (MSM) in 1988 to regulate and control the Omani securities market. After ten years of continuous growth, there was a need for a better functioning of the Market. The MSM was restructured in 1998 and promulgated the new Capital Market Law. It provides for the establishment of two separate entities: an exchange, Muscat Securities Market, where all listed securities are traded, and the Capital Market Authority (CMA), the regulator. The Exchange is a governmental entity financially and administratively independent from the regulator, but subject to its supervision.

Qatar

Qatar established the Doha securities market (DSM) in 1995. The market started its activities in 1997. Trading started manually, and then turned semi-electronic with the accomplishment of the central registration project. It became fully electronic when the electronic trading project was implemented in 2002. In 1997, the market started operations with 17 companies listed. By December 2003, the number rose to 28

companies. Annual trading value was estimated, before opening the market, at around $87.7 million, and by 2003 the trading value was around $3.2 billion.

In 2001, GCC citizens were allowed to invest in the industrial and service sectors at a proportion not exceeding 25 percent. Non-Qataris in general have been allowed to invest in newly established or privatized companies. A new investment fund law is expected to be issued soon to allow non-Qataris to invest indirectly in different sectors of the market.

Saudi Arabia

Saudi Arabia has the largest stock market in the MENA region in terms of capitalization, which was $150.8 billion in 2003, with 70 companies listed on the exchange. In 1984, the Saudi Share Registration Company (SSRC) was established by the commercial banks. The company provides central registration facilities for joint stock companies, and settles and clears all equity transactions. In 1990, automated clearing and settlement were introduced to facilitate trading, clearing and settlements, and were operated by the Saudi Arabian Monetary Agency (SAMA). Only nationals can own and trade in shares, but recently other GCC nationals were allowed to trade and own Saudi shares up to 25 percent of the capital. Trading is done through banks, which act as brokers, but the government has a new plan to establish a stock exchange market in the near future.

The Saudi stock market had a strong growth from 2000 to 2003. The volume of transactions and value traded increased dramatically. Market capitalization has increased dramatically, mainly in 2003, by 110 percent, from $74.8 billion in 2002 to $157 billion in 2003.

GCC had a study of efficiency in a thinly traded stock market, the Butler and Malaikah (1992) study on the Kuwait and Saudi stock market exchanges. The study runs autocorrelation tests on 36 Kuwaiti stocks and 35 Saudi stocks traded between 1985 and 1989. The results showed all Saudi stocks violated the independence assumption, whereas only 14 Kuwaiti stocks were in violation. The difference is attributed to the stock exchange mechanism of each country. Kuwait's stock exchange is based on centralized auctioning, while the Saudi stock exchange allows a 12-bank monopoly over the market.

United Arab Emirates

The UAE established two official stock markets in 2000: the Abu Dhabi Securities Market (ADSM) and Dubai Financial Market (DFM). ADSM is a governmental entity, with five sectors and 30 listed companies. On the other hand, DFM has been established as a public institution having its own independent body corporate, with five sectors and 13 listed companies. In 2003, the two markets had 43 listed companies with market capitalization of $44 billion. The volume of trade and turnover are very low in the UAE market because the government owns a large percentage of shares. The traded value in 2002 for both markets was $1 billion, and the turnover was 3.52 percent. The turnover was 1.78 percent for ADSM and 7.26 percent for DFM in 2002.

II.1.C. THE LEVANT: AN OVERVIEW

The Levant region has three countries in our sample. The total of three markets in that region is considered small in terms of market capitalization, with only $81 billion in

2003, of which $68.6 billion is Turkey's capital market. Jordan and Lebanon have their own privatization programs, and each country is trying to get more FDI from the GCC region countries and developed countries.

Jordan

Jordan has had a capital market since 1978. In 1999, Jordan had established the Amman Stock Exchange (ASE) as a result of the restructuring process of the Jordan Capital Market. The ASE is a private sector, non-profit organization with legal and financial independence, and is in charge of running the market. Securities are electronically traded on the ASE, and in 2003 it had 161 listed companies with market capitalization of $10.9 billion and a turnover of 23.78 percent. In 1996, Jordan started its privatization program by selling the ownership of 44 companies between 1996 and 2001 with revenue of $1.1 billion.

Lebanon

The Lebanon stock market is the smallest market in MENA in terms of market capital and listed companies. In 2003, market capitalization was $1.5 billion with 14 listed companies. The market turnover ratio was 8.2 percent in 2002.

Turkey

The origin of an organized securities market in Turkey has its roots in the second half of the 19th century. The first securities market in the Ottoman Empire was established in 1866 under the name of "Dersaadet Securities Exchange," following the Crimean War. Dersaadet Exchange also created a medium for European investors who were seeking higher returns in the vast Ottoman markets. Following the proclamation of the Turkish Republic on the ruins of the Ottoman Empire, a new law was enacted in 1929

to reorganize the fledgling capital markets under the new name of "Istanbul Securities and Foreign Exchange Bourse."

The Istanbul Stock Exchange (ISE) was established in early 1986. The ISE is the only securities exchange in Turkey established to provide trading in equities, bonds and bills, revenue-sharing certificates, private sector bonds, foreign securities and real estate certificates, as well as international securities. The ISE is governed by an Executive Council composed of five members elected by the General Assembly.

Turkey has a liberal foreign exchange regime, with a convertible currency as well as a policy that allows foreign institutional and individual investments in securities listed on the ISE since 1989. There are no restrictions on foreign portfolio investors trading in the Turkish securities markets. The market capitalization for Turkey's capital market was $68.6 billion with 265 listed companies and a turnover of 144.8 percent. Regulatory changes encouraged participation, improved information quality, and led to price impounding information more rapidly, suggesting markets become efficient with high trading volume, reliable information, and an appropriate institutional framework (Antoniou, Ergul and Holmes 1997). In addition, contrary to empirical evidence on other emerging capital markets, daily returns in ISE do not possess long memory characteristics (Kilic 2004).

ISE had the most research in the MENA region. The papers and studies have increased in recent years, and I will try to cover some findings for ISE. Odabasi, Aksu and Akgiray (2004) study the properties of the stock returns on the ISE for the January 1988 to December 1999 period and try to assess the evolution of the underlying stochastic structure over this time period. The study also investigates empirically the

relative efficiency of the ISE to test whether the rapid development of this market over the last decade caused it to become a relatively more efficient market. The findings indicate that the price mechanism in the ISE has evolved into a more informationally efficient process in little more than a decade of existence.

Bildik and Elekdag (2004) study the effects of price limits on stock return volatility by testing the overreaction and information hypotheses for the ISE. They implement structural break tests as well as a comprehensive GARCH framework to estimate the impact of price limits on volatility, controlling for structural breaks, financial and economic crises, trading activity, and business cycle fluctuations. Their results do not support the information hypothesis. The fundamental conclusion of this paper is that the two-hour break between the two daily sessions reduces volatility by acting as a circuit breaker, which facilitates the dissemination of valuable information, thus preventing severe overreactions to news events, which are consistent with the overreaction hypothesis.

Batchelor and Orakcioglu (2003) test the proposition that stock dividends have no effect on company value, using a novel GARCH process with event-related intercept terms to capture induced changes in the volatility of stock prices. Returns rise in advance of stock dividend payments, but this effect becomes statistically insignificant when proper allowance is made for heteroscedasticity. Volatility rises after stock dividend payments, and this is attributed to persistence following exceptionally large price movements around the ex-dividend day, rather than to any transitory rise in the unconditional returns variance. The study documents some irrationality in responses to

cash dividends, with prices rising/falling after increased/decreased dividend payments, rather than after the much earlier dividend announcements.

Comparing returns between value and growth, and between small and large capitalization portfolios for ISE, Gonenc and Karan (2003) show growth portfolios have superior performance over value portfolios. Thus, results do not confirm the evidence from most developed and emerging markets. Moreover, inconsistent with the evidence from developed markets, monthly and annual small-large portfolio spreads favor large stocks. These results reflect that the structure of the market and the fundamentals of stocks traded in the ISE differ from markets around the world. Time series regression results show that the average returns on value and growth portfolios are not sensitive to market movements. Size and B/M risk factors, along with market risk premiums, produce better descriptions of the returns on value and growth portfolios.

ISE became significantly integrated in the global market only in the period following market liberalization in late 1989. Darrat and Benkato (2003) analyze stock returns and volatility relations between the ISE and the global market as represented by stock markets in the US, the UK, Japan and Germany. The results suggest that the Asian crisis in mid-1997 and the consequent Russian economic meltdown in mid-1998 are partly responsible for the recent excessive volatility in the Turkish market. The results also identify the US and the UK markets as dominant sources of volatility spillovers for the ISE, even in the period following the Asian-Russian crisis. Consequently, it appears that the two matured markets of the US and the UK shoulder significant responsibility for the stability and financial health of smaller emerging markets like the ISE. On the other hand, Yuce and Simga-Mugan (2000) examine long-run linkages and short-run dynamic

interactions among stock price indices in nine stock exchanges (Prague, Moscow, Warsaw, Istanbul, Budapest, London, New York, Frankfurt, and Tokyo) from 1994 to 1999. They expected to find co-integration relations among the Eastern European stock markets because of the close economic ties among them. However, no such relationships have been found. There is no significant relationship between Istanbul and Moscow stock markets. Although ISE has reacted strongly to the Russian stock market crash of 1998, it is quite surprising, considering the economic ties between the two countries, that the paper did not find any significant long-run relationship between the Istanbul and Moscow stock markets.

Oguzsoy and Guven (2003) investigate the day-of-the-week effect on stock returns in ISE for the period between 1988 and 1999. The analysis of the ISE National 100 Composite index reveals strikingly low Tuesday and dominantly high Friday returns, with return variances at their lowest on Fridays. It is also observed that for most of the stocks among the 30 highly traded stocks of ISE, maximum return is on Fridays, whereas minimum return is on either Mondays or Tuesdays, with return variances at their highest on Mondays.

II.1.D. NORTH AFRICA: AN OVERVIEW

The North Africa region, with the three countries in our sample, has the most aggressive privatization programs in MENA. Morocco, Egypt and Tunis had almost 65 percent of the total revenue of the privatization program from 1990 to 2001, of Arab countries.

Studies in African stock markets are few. One study by Appiah-Kusi (2002) covers return predictability in African stock markets. The study's results confirm that markets in Egypt, Kenya, Zimbabwe, Mauritius and Morocco are efficient, while Botswana, Ghana, Ivory Coast, Swaziland and South Africa are not consistent with weak-form efficiency.

Morocco

Morocco has had its stock market since 1929. In 2003, the market capitalization for the Casablanca Stock Exchange (CSE) was $13 billion with 52 listed companies. Starting in 1997, CSE migrated from open outcry to an electronic trading system. All securities quoted on the CSE are now traded on the electronic trading system, using trading screens supplied to brokerage firms. Morocco started its privatization program in 1989 with a list of 112 firms, and in 1994 the Morocco government added two petroleum firms. At the end of 2001, the government sold 65 firms with revenue of $5.2 billion.

Egypt

Egypt's history of financial markets dates back more than 100 years. The Alexandria Stock Exchange was established in 1883, while the Cairo Stock Exchange was established in 1903. Now the name is Cairo and Alexandria Stock Exchanges (CASE), with 967 listed companies and a market capitalization of $27.8 billion in 2003. Egypt started its privatization program in 1991 with a target of transferring part or all of 314 firms' ownership to the private sector.

Tunisia

The Tunis stock exchange is one of the smallest in MENA in terms of market capitalization, after Lebanon, and the smallest in the North Africa region in terms of

traded value, traded shares and market turnover. In 2003, the market capitalization was $2.4 billion with 45 listed companies. Value traded in 2003 was only $189 million, with market turnover of 7.7 percent.

The privatization program of the Tunisian government started in 1989, but they did not have a target of which firms would be in that program. In 2000, the government had a list of 44 firms as a target for privatization, and at the end of 2001, the government had transferred 138 firms with $975 million revenue.

II.2. MENA CAPITAL MARKETS

During 2003, the total market capital of MENA had a major increase. At the same time, the number of listed companies decreased. The number of listed companies decreased from 1,965 in the year 2001 to a total of 1,938 companies in 2003. Total market capitalization of the participating markets increased from $212.9 billion in 2001 to $429.5 billion by the end of 2003, (see Table 2.4). The major increase in market capital was mostly due to the increase in newly listed companies in Kuwait, Qatar, and UAE markets and the listing of the new telecom company in the Saudi market. However, the mergers and write-offs of some companies were mainly responsible for the reduction of the number of listed companies in some of the markets, including Egypt, Morocco and Saudi Arabia, whereas the number of listed companies increased in all other markets. The number of listed companies declined in the Saudi Stock Market in 2002, due to the merging of electricity companies to form one company.

[INSERT TABLE 2.4 HERE]

[INSERT FIGURE 2.1 HERE]

[INSERT FIGURE 2.2 HERE]

The largest market in terms of capitalization is the Saudi market with $157 billion, and the smallest is the Lebanon market with $1.5 billion in 2003. We find that all markets as regions had growth in capital and listed companies from 2001 to 2003, and only North Africa countries (Egypt, Morocco) had a decline in the number of listed companies in the same period. In terms of listed companies, Egypt had the most listed companies in all markets, with 1,110 companies in 2001 and 967 companies in 2003. At the same time, the capital of Egyptian markets is not one of the largest among the markets. The company market value average in each market differs from market to market. The highest company market value average is the Saudi market with $2.2 billion per company, and the lowest is Egypt's, with $29 million in 2003.

In the GCC region, most company market value averages are high, and the top four markets in the GCC region are the Saudi, UAE, Qatar, and Kuwait capital markets. The market capitalization for GCC is $305 billion and represents 71 percent of all markets, but only 18.9 percent for the Levant and 10 percent for North Africa in 2003. In terms of listed companies, the North Africa region has the most companies, with 55 percent of all the market, while the GCC has 22.4 percent and the Levant has 22.7 percent.

[INSERT TABLE 2.5 HERE]

[INSERT FIGURE 2.3 HERE]

[INSERT FIGURE 2.4 HERE]

From Table 2.5, we find good performance in total traded value, which increased from 2001 by 169 percent, reaching $329.7 billion in 2003 for the total markets. The

Saudi, Turkey and Kuwaiti markets dominated the trading values compared to other MENA countries.

During 2001-2003, the total value traded in the Saudi market increased by 615.7 percent, and the Kuwaiti market increased by 367 percent. In 2003, the Saudi market represented 36.6 percent, the Turkish market represented 16 percent, and the Kuwaiti market represented 13.8 percent of all markets. The turnover ratio has increased and is high in both the Saudi and Kuwaiti markets. From 2001 to 2003, the Kuwait market turnover ratio increased by 109 percent, reaching 92 percent, and the Saudi market turnover ratio increased by 233 percent, reaching 101 percent. The Saudi, Turkey and Kuwaiti markets have high turnover ratios and are more liquid than other markets in the sample.

Comparing regions, we find, from Table 2.5, that the GCC region on average is superior in market turnover to other regions. On the other hand, the GCC region has two countries with low market turnover, Bahrain and UAE. Thus, not all the MENA markets are the same and not all the regions within MENA are the same.

Girard, Omran and Zaher (2003) investigate relationships between market risk premium, time-varying variance, and time-varying co-variance in eleven MENA markets and eight developed markets from 1990 to 2001. The study finds MENA markets are highly segmented and provide diversification benefits to the global investor. In addition, they test for asymmetric patterns of reward to risk and observe that six out of the eleven MENA markets return series exhibit an overly pessimistic reaction unwarranted by market variance alone. This finding supports the overreaction hypothesis and sets grounds for contrarian portfolio strategies.

II.3. ECONOMIC REFORM AND DEVELOPMENT IN MENA CAPITAL MARKETS

The economic reforms in the MENA countries have strengthened the recognition that Arab capital markets play an important role in the economic development process. MENA capital markets witnessed remarkable developments in their various aspects, including the legal and organizational levels, thereby contributing to their foundation on sound structures, which are constantly evolving.

Broadly, these developments involved an improvement in the performance of capital markets, a strengthening of their supervision, and increased trading on their floors. They also related to the amendment of tax systems, the streamlining of administrative procedures, the creation of a favorable environment suited to the requirements of market factors, the introduction of new financial instruments offering a greater variety of investment opportunities, the acceleration and simplification of trading operations, and the promotion of transparency and disclosure. Added to these was the improvement in skills of operating staff and enhanced discipline and professional ethics.

In promotion of the market supervision function, a number of MENA countries have proceeded to separate supervisory and executive roles, the first being discharged by a public sector affiliated body, while the second is mostly carried out by the private sector. By the end of 2002, the separation between supervisory and executive roles took place in the following seven MENA capital markets: Jordan, Egypt, Oman, Tunisia, Morocco, and UAE. The two roles continue to be simultaneously in the hands of the capital market itself in the rest of the MENA countries.

The MENA capital markets have been attaching greater importance to the need for increased transparency and disclosure, for adapting its exigencies to meet international standards in order to enhance the supervisory role on the one hand, and to ensure equal opportunities for market operators, on the other hand. Most of these markets have signed agreements with world-class companies specializing in automated instant reporting on trading, including Reuters and Bloomberg. It is worth noting that these markets are also disseminating their data through the Internet in order to further publicize investment opportunities, which they offer. Moreover, the websites of these stock exchanges are now posting daily updated information on trading, with some historical data and some information that I find useful.

Most capital markets have been seeking to develop the means of enhancing market stability and protecting it from sharp fluctuations. In this regard, authorities in MENA countries have been encouraging the development of the institutional investor's role and expansion of investment instruments by creating savings accounts in market-listed shares, which enjoy low capital gain tax, and by authorizing pension funds and insurance companies to deal in those markets. In addition, the stock exchanges encourage the increase of available investment instruments and alternatives such as convertible bonds, options, forward contracts and investment funds. Investment funds, which have been established in all MENA capital markets, are being viewed as the most suitable instrument for mobilizing savings and attracting foreign capital. In addition, they offer to foreigners residing in MENA countries the opportunity to enter local financial markets if the law has any restriction on direct investment.

Investment by-laws in most MENA countries have witnessed a number of changes mostly aimed at attracting foreign investments, meeting domestic financing requirements, and transferring advanced technologies into their markets. The changes involved represent part of the steps taken by those countries to open the door for foreign investments by removing the obstacles used to impede their flow. In this context, MENA countries can be divided into two groups. The first includes countries which do not impose any restrictions on foreign investments in financial papers; these are Egypt, Morocco, Jordan, Turkey and Lebanon. The second group comprises countries where such restrictions exist in varying degrees; these are Tunisia and the member states of the GCC.

Many MENA countries thoroughly amended their tax systems towards creating incentives to encourage dealing in financial papers on the one hand, and attracting foreign investments on the other. By virtue of those changes, these countries either reduced or eliminated taxes on current returns and capital gains arising from dealing in financial papers. It must be noted that no such taxes existed in all the Arab countries, which had regular financial markets, except in Morocco, which imposes a 10 percent tax. Moreover, some Arab countries also directed their tax reform towards encouraging joint-stock companies to have their shares listed on their exchanges.

Most MENA capital markets took vast steps to modernize their dealing systems and to introduce modern technologies in share trading operations, with a view to improve performance, enhance speed and accuracy in the conduct of business, and increase transparency and operators' confidence. As a result, high-tech automated dealing systems were introduced to the markets.

MENA stock exchanges have made major strides on the path of cooperation and integration among themselves by concluding bilateral and trilateral agreements. The thrust of the latter is to increase collaboration between stock exchanges in the areas of financial papers issue and trading, organizing and facilitating clearing and settlement mechanisms, and the exchange of information. These agreements also aim at developing cooperation between intermediation institutions in those markets and encourage joint/cross listings. In that regard, agreements were signed between the stock exchanges of Bahrain, Kuwait and Oman, on the one hand, and those between the stock exchanges of Bahrain and Jordan, on the other. Comparable agreements were also concluded between Kuwait, Lebanon and Egypt in one case; and a memorandum of understanding was signed in the case of Jordan and Kuwait.

Given the considerable economic potential of the MENA, there would appear to be favorable prospects for substantial mobilization of funds from domestic, regional, and external investors. Indeed, not only are there indications of portfolio funds in the hands of industrial country investors that could move into these markets, but there is also a significant pool of offshore Middle Eastern savings that could be expected to be manifest in inflows to equity markets in the region. Finally, equity markets could provide the scope for increased trading of Islamic-based financial instruments.

From the above illustration, we could find the MENA economic trip of development. As we can see, MENA stock markets have shown improvement and development, in recent years, with respect to their laws and the openness of their markets. At the same time, MENA financial markets lack major research on various topics. I will try to cover some of these topics in the next chapters.

Table 2.1
Human Development Indicators in the Middle East and North Africa

	Per Capita GDP (U.S.$)		Literacy rate [a]		Life expectancy [b]		GDP% on education [c]	
Country	1995	2002	1995	2002	1995	2002	1995	2000
Bahrain	10,138	10,889	85.19	88.50	72.43	73.29	3.63	3.00
Egypt, Arab Rep.	1,034	1,250	51.12	56.93	65.34	68.86	4.67	NA
Jordan	1,604	1,660	86.51	90.90	70.37	71.96	8.23	4.95
Kuwait	14,738	11,598	78.98	82.94	75.74	76.90	6.11	NA
Lebanon	2,776	2,868	83.34	86.93	69.31	70.76	2.73	3.04
Morocco	1,250	1,455	43.94	50.73	65.75	68.35	5.60	5.03
Oman	5,668	6,147	63.68	74.41	71.60	74.06	3.93	3.99
Qatar	16,642	28,140	79.25	82.11	73.84	74.94	NA	3.58
Saudi Arabia	7,825	7,562	71.25	77.88	70.91	73.11	5.54	8.34
Tunisia	2,008	2,574	64.67	73.17	71.35	72.65	6.48	6.84
Turkey	2,743	2,942	81.84	86.50	68.34	69.94	2.25	3.46
United Arab Emirates	17,105	17,520	73.44	77.26	74.73	75.37	1.86	1.95
United Kingdom	19,484	22,974	NA	NA	76.64	77.49	5.19	4.42
United States	27,713	31,891	NA	NA	75.62	77.33	NA	4.86
Japan	42,282	45,029	NA	NA	79.54	81.56	NA	3.56
Middle East & North Africa	1,899	2,099	63.27	69.38	66.07	68.58	4.67	4.30
World	5,182	5,697	72.73	NA	65.90	66.71	4.58	4.07
European Monetary Union	23,609	26,875	NA	NA	77.05	78.35	4.83	5.20
South Asia	387	485	52.28	59.34	60.77	62.98	3.05	3.08
East Asia & Pacific	762	1,050	82.48	NA	68.00	69.43	2.95	2.31
Europe & Central Asia	2,131	2,595	98.67	NA	67.80	68.60	5.05	NA
High income [1]	26,095	29,516	NA	NA	76.69	78.19	5.15	5.21
Upper middle income [2]	4,246	4,638	NA	NA	71.85	73.44	4.84	4.38

Source: World Development Indicators Database, World Bank.

Source: Arab Monetary Fund.

(a) Literacy rate, adult total (% of people ages 15 and above)

(b) Life expectancy at birth, total (years)
(c) Public spending on education, total (% of GDP)
1. High-income economies are those in which 2002 GNI per capita was $9,076 or more.
2. Upper-middle-income economies are those in which 2002 GNI per capita was between $2,936 and $9,075.
Note: East Asia and Pacific, Europe and Central Asia, Middle East & North Africa regions does not include high-income economies. There are no economies in South Asia classified as high income.

Table 2.2
Economic Development Indicators in the Middle East and North Africa

	Personal computers [a]		Fixed & mobile phone [b]		Internet users [c]		Mobile phones [d]	
Country	1995	2002	1995	2002	1996	2002	1995	2002
Bahrain	52.15	160.44	300.32	846.36	8.70	247.47	49.21	583.28
Egypt, Arab Rep.	4.30	16.64	46.81	177.15	0.67	28.23	0.13	66.77
Jordan	8.16	37.53	76.77	355.43	0.45	57.70	2.89	228.86
Kuwait	52.73	120.56	277.44	722.88	7.92	105.75	65.27	519.04
Lebanon	16.61	80.53	188.97	425.75	1.62	117.13	39.87	226.97
Morocco	3.19	23.61	43.48	247.14	0.06	23.61	1.11	209.11
Oman	9.26	35.04	82.43	255.42	0.01	66.40	3.73	171.49
Qatar	54.45	180.33	256.21	727.41	8.96	114.75	33.52	438.03
Saudi Arabia	35.62	130.23	95.09	361.04	0.27	61.53	0.88	217.17
Tunisia	6.70	30.67	58.60	168.89	0.28	51.68	0.36	51.52
Turkey	14.92	44.60	221.48	628.63	1.91	72.84	7.09	347.46
United Arab Emirates	49.26	129.01	342.87	1,009.67	4.28	337.05	55.19	696.12
United Kingdom	201.32	405.70	599.66	1,431.34	40.81	423.10	97.86	840.73
United States	326.20	658.88	731.48	1,133.96	168.00	551.38	127.71	488.15
Japan	120.25	382.16	589.35	1,194.86	43.71	448.86	93.27	636.55
Middle East & North Africa	12.72	38.17	58.67	158.78	0.32	36.64	0.36	51.52
World	42.05	100.79	123.90	285.62	14.53	130.69	1.94	109.69
European Monetary Union	131.24	317.55	520.54	1,360.25	46.97	331.38	39.30	805.22
South Asia	1.54	6.82	11.92	42.05	0.69	13.70	0.01	8.28
East Asia & Pacific	3.63	26.26	31.99	155.00	1.50	43.74	0.90	23.82
Europe & Central Asia	18.21	73.40	165.68	424.24	5.21	87.07	0.40	196.27
High income	198.56	466.85	582.13	1,283.07	42.83	363.50	60.82	697.63
Upper middle income	29.62	100.62	142.69	431.28	7.66	148.91	5.78	241.28

Source: World Development Indicators Database, World Bank.

Source: Arab Monetary Fund.

(a) Personal computers (per 1,000 people)

(b) Fixed line and mobile phone subscribers (per 1,000 people)

(c) Internet users (per 1,000 people)

(d) Mobile phones (per 1,000 people)

Table 2.3

Capital Market Development Indicators in the Middle East and North Africa

	Market capitalization [a]		Market capitalization (% of GDP) [b]		Stocks traded (% of GDP) [c]		Turnover ratio (%) [d]	
Country	1999	2002	1999	2002	1999	2002	1999	2002
Bahrain	7,150	6,850	107.99	89.16	6.71	2.76	6.38	2.97
Egypt, Arab Rep.	32,800	26,100	36.82	29.05	10.14	2.85	31.61	16.13
Jordan	5,830	7,090	71.67	76.23	6.74	14.39	9.39	14.78
Kuwait	18,814	35,099	64.47	99.24	20.77	81.94	32.80	63.03
Lebanon	1,920	1,400	11.61	8.10	0.55	0.69	9.34	4.66
Morocco	13,700	8,590	38.87	23.80	7.18	1.63	17.60	10.65
Oman	4,300	4,000	27.37	19.70	3.37	2.61	10.39	13.04
Qatar	5,502	10,567	45.11	60.50	2.78	5.06	7.30	8.36
Saudi Arabia	60,400	74,900	37.48	39.74	9.19	18.93	28.77	30.36
Tunisia	2,710	2,130	13.03	10.13	2.02	1.05	13.25	13.73
Turkey	113,000	34,000	61.47	18.51	44.21	38.48	102.76	163.43
United Arab Emirates	7,687	29,845	13.99	42.06	0.15	0.42	NA	3.52
United Kingdom	2,933,280	1,864,134	200.89	119.02	94.36	173.75	51.90	135.40
United States	16,635,114	11,052,403	180.57	106.45	201.61	244.35	123.50	202.51
Japan	4,546,937	2,126,075	101.73	53.24	41.37	39.40	52.50	71.00
Middle East & North Africa	144,408	124,210	23.40	18.52	6.75	6.55	22.34	19.40
World	36,128,449	23,359,484	117.70	72.29	100.95	122.84	91.64	131.86
European Monetary Union	5,705,587	3,485,194	85.51	52.42	57.35	67.36	94.70	123.15
South Asia	194,871	144,070	33.52	22.20	52.58	35.39	101.87	210.55
East Asia & Pacific	646,740	702,100	43.47	38.30	35.95	24.43	111.48	75.35
Europe & Central Asia	254,704	234,597	29.76	20.71	14.08	12.29	49.06	55.53
High income	34,029,186	21,522,736	135.79	82.61	117.32	145.23	97.95	146.44
Upper middle income	602,792	539,604	36.79	31.58	9.26	7.08	27.06	27.21

Source: World Development Indicators Database, World Bank.

Source: Arab Monetary Fund.

(a) Market capitalization of listed companies (current US$ In Million)

(b) Market capitalization of listed companies (% of GDP)

(c) Stocks traded, total value (% of GDP)

(d) Stocks traded, turnover ratio (%)

Table 2.4

Market Capitalization and Number of Listed Companies for Middle East and North Africa Stock Markets

	Capitalization*				Listed Companies			
Country	1995	1998	2001	2003	1995	1998	2001	2003
Bahrain	4,707	6,772	6,601	9,702	36	42	42	44
Kuwait	14,400	18,424	26,662	59,528	51	78	88	108
Oman	1,971	4,537	2,634	7,246	82	137	96	141
Qatar	-	3,837	5,152	26,702	-	-	-	28
Saudi Arabia	40,904	42,631	73,201	157,306	69	74	76	70
UAE	-	9,069	7,881	44,647	-	-	-	43
GCC total	61,982	85,270	122,132	305,131	238	331	302	434
Jordan	4,724	5,863	6,314	10,963	97	150	161	161
Lebanon	400	2,425	1,248	1,503	-	12	14	14
Turkey	20,800	33,600	47,700	68,624	922	686	278	265
Levant total	25,924	41,888	55,262	81,090	1,019	848	453	440
Egypt	8,074	24,381	24,309	27,847	676	861	1,110	967
Morocco	5,971	15,610	9,031	13,050	44	53	55	52
Tunisia	3,869	2,229	2,230	2,440	26	39	45	45
North Africa total	17,913	42,221	35,569	43,337	746	953	1,210	1,064
TOTAL	105,819	169,379	212,963	429,559	2,003	2,132	1,965	1,938

Source: Arab Monetary Fund, AMDB

Source: World Development Indicators database

* In $ Million.

Table 2.5

Traded Value and Market Turnover Ratio for Middle East and North Africa Stock Markets

	Trade Value*				Turnover**			
Country	1995	1998	2001	2003	1995	1998	2001	2003
Bahrain	106	577	250	216	2.25	8.52	3.79	2.23
Kuwait	6,394	10,918	11,711	54,729	44.40	59.26	43.93	91.94
Oman	211	2,371	420	1,334	10.71	52.27	15.94	18.41
Qatar	-	-	-	3,220	-	-	4.50	12.06
Saudi Arabia	6,194	13,745	22,223	159,056	15.14	32.24	30.36	101.11
UAE	-	-	-	2,031	-	-	3.90	4.55
GCC total	12,905	27,611	34,605	220,586	20.82	38.16	31.72	72.29
Jordan	517	655	934	2,607	10.94	11.17	14.80	23.78
Lebanon	-	337	53	131	-	13.89	4.24	8.72
Turkey	52,311	69,696	79,945	99,406	254.37	208.22	169.41	144.85
Levant total	52,828	70,687	80,932	102,144	265.31	233.27	188.45	177.35
Egypt	672	5,368	5,913	4,349	8.32	22.01	24.32	15.62
Morocco	291	1,402	841	2,443	4.87	8.98	9.31	18.72
Tunisia	604	165	342	189	15.62	7.38	15.34	7.73
North Africa total	1,567	6,934	7,096	6,981	8.75	16.42	19.95	16.11
TOTAL	67,300	105,232	122,632	329,710	17.71	28.92	28.04	63.81

Source: Arab Monetary Fund, AMDB

Source: World Development Indicators database

* In $ Million.

** Percentage

Figure 2.1
Market Capitalization Percentage for Middle East and North Africa Stock Markets

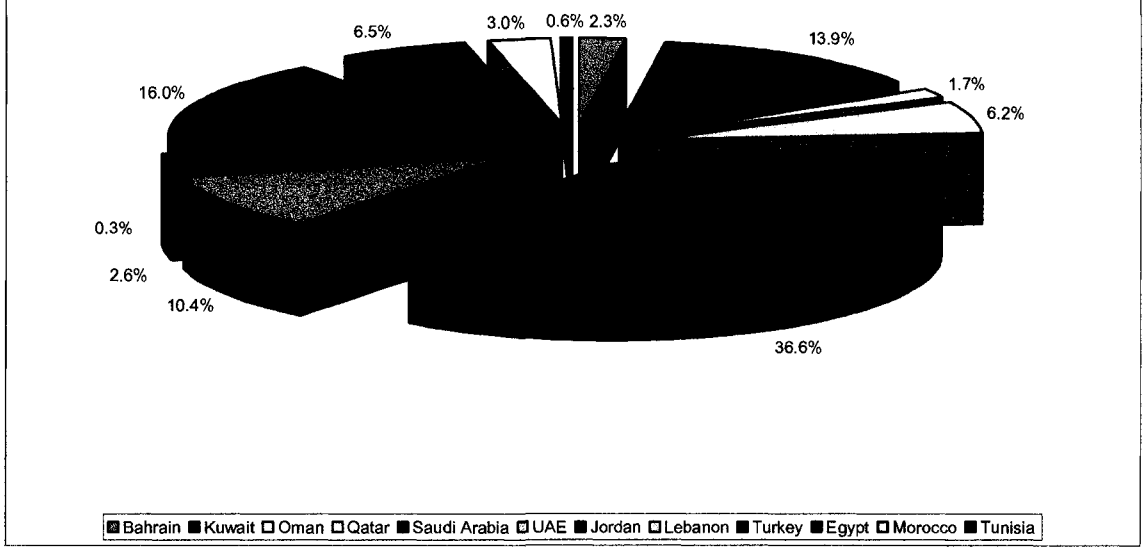


Figure 2.2
Market Capitalization and Trade Value for MENA Stock Markets in 2003

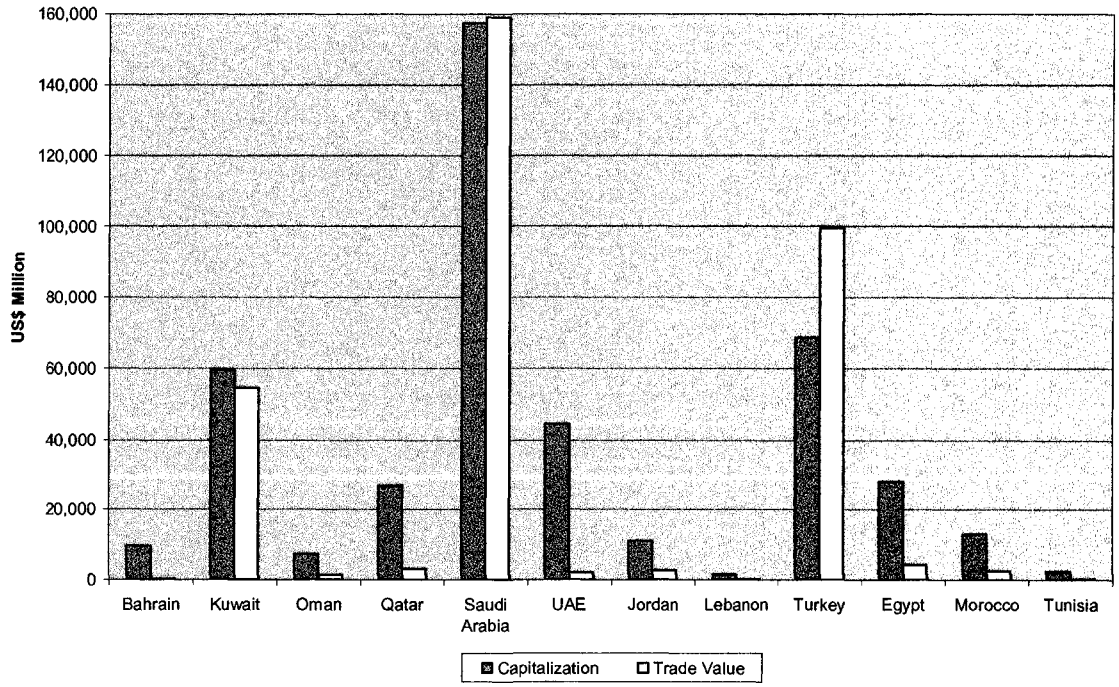


Figure 2.3
Listed Companies in MENA Markets - 2003

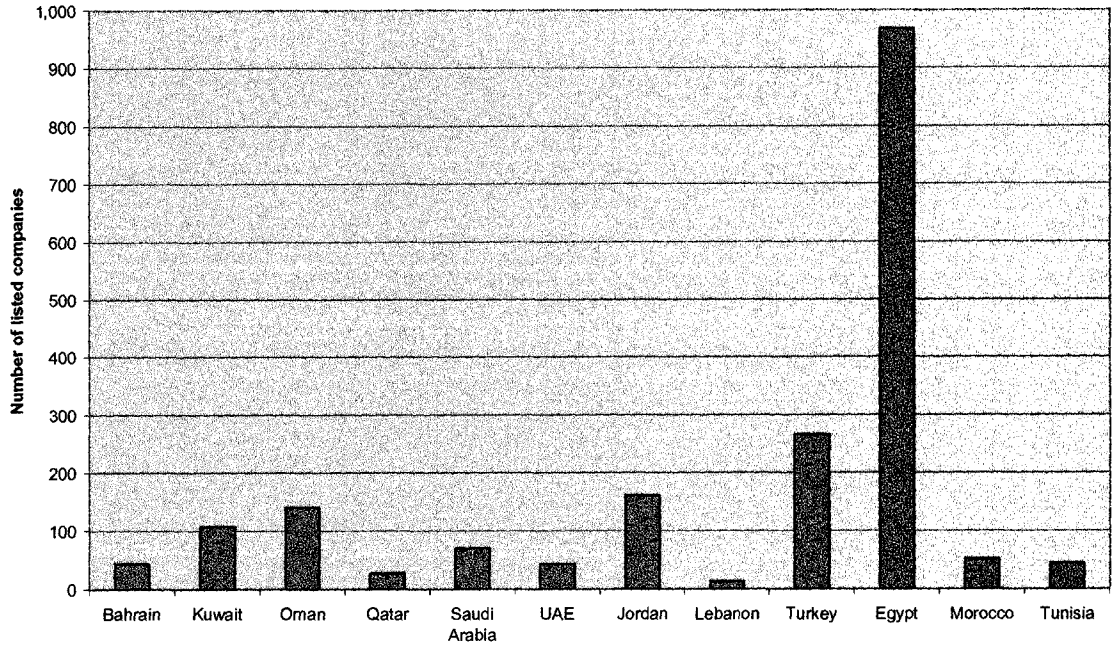
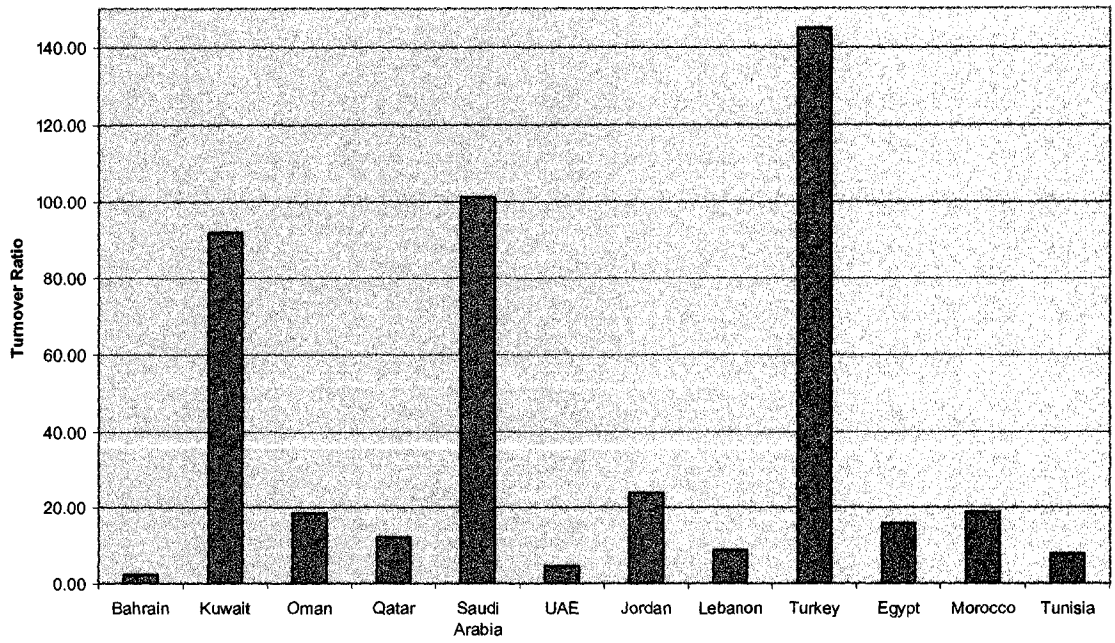


Figure 2.4
Turnover in MENA Stock Markets - 2003



CHAPTER III

WINNER-LOSER REVERSALS IN MIDDLE EAST AND NORTH AFRICA NATIONAL STOCK INDICES

III.1. LITERATURE REVIEW

Market efficiency hypothesis, which claims that security prices fully reflect all available information (Fama 1991), has been one of the most dominant themes in financial research, and there is no other proposition in economics which has more solid empirical evidence supporting it than efficient markets hypothesis (Jensen 1978). It is now being seriously questioned because of the evidence on the return of stock overreaction (Zarowin 1990). The overreaction hypothesis claims that investors systematically overreact to extreme events and place too much emphasis on relatively recent information.

The performance of the sample is observed during its formation period. After the formation period, sample stocks are sorted according to their performance. The best-performing stocks go into a winner portfolio, and the worst-performing stocks are sorted into a loser portfolio. After the formation period, the performance of the stocks is observed in a test period. If the information is reflected in current stock prices, there should be no difference in the performance of winners and losers.

The most influential paper on the overreaction hypothesis is the one by DeBondt and Thaler (1985) that observed reversals over long horizons in the cross section of stock returns. In their paper, DeBondt and Thaler show that former over-performing stocks (winners) under-perform the market subsequently, and former under-performing stocks

(losers) over-perform the market, and that has been called the winner-loser effect. This behavior implies that investors tend to overreact in the sense that they overweight recent information and underweight prior information.

DeBondt and Thaler (1985) test the contrarian/overreaction hypothesis that there will be stock price reversals should stock prices systematically overshoot. The more overreaction, the more reversals there will be. Based on monthly return data for common stocks from the New York Stock Exchange (NYSE) from 1926 to 1982, the stock returns were ranked in the formation period on return performance, classifying the top performers as "winners" and the bottom performers as "losers."

For period lengths of 1, 2, 3, and 5 years, DeBondt and Thaler investigate the performance of extreme portfolios. For the three-year portfolio, they find an excess return of 24.6 percent, and find 31.9 percent for the five-year one. This long-term effect is called the winner-loser effect. In the short-term period, no significant results are obtained. The pattern of the winner-loser effect shows, first, that the winner-loser effect is asymmetric; compared to an equally weighted index, most of the excess return is obtained for the loser portfolio. Second, because of strong seasonality most of the return is obtained during January; thus, the loser portfolio shows a strong over-performance during that month.

DeBondt and Thaler (1987) investigate different possibilities of how to explain the winner-loser effect. They relate returns to additional explanatory variables. The alternative hypotheses are based on firm size, differences in risk, and seasonal patterns of returns. In the January effect, they find that an additional return is obtained on the entire market portfolio. If both winner and loser portfolios benefit from the turn of the year

effect to the same extent, this should have no effect on the winner-loser effect. Therefore, the seasonal pattern of the winner-loser effect is an additional finding. The seasonal pattern is due to an additional return on the loser portfolio in January. DeBondt and Thaler did not find any particular pattern in terms of the size distribution. The average size of a company in any of the portfolios is approximately the same. They find significant differences with respect to market-to-book ratios and earning yields.

Similar investigations of the winner-loser effect have been done for other investment horizons and other stock markets. For the United States (US) market, Liang and Mullineaux (1994) and Fant and Peterson (1995) both provide evidence that supports the existence of an overreaction effect. Clare and Thomas (1995) and Dissanaike (1997) find evidence consistent with the overreaction effect in the United Kingdom (UK) market. Baytas and Cakici (1999) tested the overreaction hypothesis in seven industrialized countries and find evidence of overreaction in all countries except the US. There are similar findings for the Spanish market by Alonso and Rubio (1990) and for the Brazilian market by Costa (1994).

Following DeBondt and Thaler's the winner-loser effect, Richards (1995 and 1997) examines the winner-loser effect in the national stock market indices of 16 countries. Richards used Morgan Stanley Capital International indices in U.S. dollars for Australia, Austria, Canada, Denmark, France, Germany, Hong Kong, Italy, Japan, the Netherlands, Norway, Spain, Sweden, Switzerland, the UK, and the US. The test used end-quarter data from 1970 to 1995. In his study, Richards finds evidence of the predictability of relative returns and the existence of a winner-loser effect across 16 national equity markets, but no evidence that loser countries are riskier than winner

countries.

The focus of this paper is to investigate the behavior of winner-loser reversals in the national stock market indices in MENA national stock markets, and to determine whether the overreaction hypothesis holds in developing countries as it did in developed countries. Research in MENA stock markets is in the infancy stage. At the same time, investors are exploring new stock markets and need all the research.

The remainder of this chapter is organized as follows: the methodology and data are outlined in section II; section III presents empirical findings; and section IV contains the summary and conclusion.

III.2. DATA AND METHODOLOGY

The methodology used is similar in most respects to that of DeBondt and Thaler (1985). However, in this study the focus on indices for national stock markets of 12 countries is treated as 12 different assets. In this study, we will use methodology of both CAR and Buy-and-Hold (B-H) returns over the entire *k*-month period.

This study uses the national indices in local currency and is transformed into US dollars by using the exchange rate, the data obtained from Global Finance Data, and from local markets. The data used in this study are from March 1994 to February 2004. The international index is S&P/IFC Emerging Markets Composite Global in US dollars. The twelve national markets are Bahrain, Egypt, Jordan, Kuwait, Lebanon, Morocco, Oman, Qatar, Saudi Arabia, Turkey, Tunisia, and the United Arab Emirates (UAE).

The returns are calculated for each of the 12 countries over a ranking period of two to three years (formation period). After the formation period, countries are sorted

according to their performance: the four countries with the highest returns are referred to as the winner portfolio, and the four countries with the lowest returns are referred to as the loser portfolio.

After the formation period, the performance of the stocks during the subsequent test period is observed by looking at the average cumulative return on each portfolio. The test period will be three years (36 months).

According DeBondt and Thaler (1995), the overreaction hypothesis suggests that "*if stock prices systematically overshoot, then their reversal should be predictable from past return data alone, with no use of any accounting data such as earnings.*" In this study, I will use countries' indices rather than stock prices. The hypotheses suggested are:

1. Extreme movements in a country's index will be followed by subsequent index movements in the opposite direction.

2. The more extreme the initial index movement, the greater will be the subsequent adjustment.

Both hypotheses imply a violation of weak-form market efficiency (DeBondt and Thaler, 1995). For this test, indices of total returns in 12 markets are used to calculate returns over ranking periods of two to three years. Calculating the returns, R_{it} for each of the 12 countries between March 1994 and February 2004 are as follows:

$$R_{it} = \ln (P_{it} / P_{it-1}) \tag{2.1}$$

where P_{it} is the closing price for each country's index i at time t. The abnormal returns for the formation period is defined as

$$AR_{it} = R_{it} - R_{mt} \tag{2.2}$$

where AR_{it} is the market-adjusted abnormal return for each country's index i in time t; where R_{it} is the return on each country's index i in time t, and R_{mt} is the return of the S&P/IFC Emerging Markets Composite Global m in time t.

I computed the cumulative market-adjusted abnormal return for every index:

$$CAR_i = \sum_{t=-(k-1)}^{0} AR_{it} \tag{2.3}$$

where CAR_i is the cumulative market adjusted abnormal return for country i in time t, for each formation period. The above step is repeated for all subsequent periods. At the end of each formation period, all countries are ranked based on their *CARs*. The top four countries are assigned to the winner portfolio *W*, and the bottom four countries are assigned to the loser portfolio *L*.

[INSERT TABLE 3.1 HERE]

The sample testing is divided into four different tests that are illustrated in Table 3.1. The tests are:

1. Test-1: One period of six years. The first three years are the formation period, and the last three years are the testing period. The formation period is from March 1998 to February 2001. On the other hand, the test period is from March 2001 to February 2004. In that only test, I used the daily returns of the countries' indices to use the market model residual for testing. I could not broaden the time or the period for lack of available daily data. Instead of using equation (2.2), I use the market model residual for the test period, which is defined as

$$AR_{it} = R_{it} - b_i R_{mt} \tag{2.4}$$

where AR_{it} is the market adjusted abnormal return for country-index i in day t; R_{it}

is the return of country-index i in time t; R_{mt} is the return of the S&P/IFC Emerging Markets Composite Global m in time t; and b_i are regression parameters of the market model using the formation period. We have 750 days for each formation and test period in that test, which represents three years each (250 trading days in each year).

2. Test-2: Two periods of six years overlapping. The first three years of each subperiod are the formation period, and the last three years are the testing period. The formation periods are from March 1994 and 1997 to February 1997 and 2000, respectively. On the other hand, the test periods are from March 1997 and 2000 to February 2000 and 2003, respectively.
3. Test-3: Three periods of five years overlapping. The first two years of each subperiod are the formation period, and the last three years are the testing period. The formation periods are from March 1994, 1996, and 1998 to February 1996, 1998, and 2000, respectively. The testing periods are from March 1996, 1998, and 2000 to February 1999, 2001, and 2003, respectively.
4. Test-4: Two periods of five years, not overlapping. The first two years of each subperiod are the formation period, and the last three years are the testing period. The first subperiod is from March 1994 to February 1999, and the second subperiod is from March 1999 to February 2004.

The second step is the testing period for the evaluation of past winners' and losers' portfolios. For every test period, using *CAR* as defined in equation (2.3), each country-index is calculated for each of the winner and loser portfolios, during the 36 months, as follows:

$$CAR_{W,n,i} = \sum_{t=1}^{36} AR_{it} \qquad CAR_{L,n,i} = \sum_{t=1}^{36} AR_{it} \tag{2.5}$$

for each $t = 1,..., 36$ and $n = 1$ in Test-1; $n = 1, 2$ in Test-2; $n = 1, 2, 3$ in Test-3; $n = 1, 2$ in Test-4.

Using the *CARs* from all test periods, *average CARs* are calculated for both portfolios' winners and losers for each month between $t = 1$ and $t = 36$. They are denoted $ACAR_{W,t}$ and $ACAR_{L,t}$. The overreaction hypothesis predicts that for $t > 0$, $ACAR_{W,t} < 0$ and $ACAR_{L,t} > 0$, so that, by implication, $(ACAR_{W,t} - ACAR_{L,t}) < 0$.

In order to assess whether, at any time t, there is indeed a statistically significant difference in investment performance, we need a pool estimate of the population variance in CAR_t, as in DeBondt and Thaler (1985):

$$S_t^2 = \frac{\left[\sum_{n=1}^{N}(CAR_{W,n,t} - ACAR_{W,t})^2 + \sum_{n=1}^{N}(CAR_{L,n,t} - ACAR_{L,t})^2\right]}{2(N-1)} \tag{2.6}$$

The t-statistic is

$$T_t = \frac{(ACAR_{W,t} - ACAR_{L,t})}{\sqrt{\frac{2S_t^2}{N}}} \tag{2.7}$$

III.3. EMPIRICAL RESULTS

In Test-1, I used daily market adjusted abnormal returns (AR), which used equation (4). This test is based on three-years for each formation and testing period. In that test, I have four sections of testing; in the first two sections (1 and 2) I used local currency rather than US$. For each section, we test for an equally-weighted portfolio for

each winner and loser portfolio and a market capitalization-weighted portfolio. Table 3.2 shows these two sections of testing and provides CAR for each winner and loser portfolio and the difference between them for each subtest. In the second two sections (3 and 4), I used US$ for all countries' indices. For each section, I also tested for an equally-weighted portfolio for each winner and loser portfolio and a market capitalization-weighted portfolio. Table 3.3 shows these two sections in panel 1 and 2 and provides CAR for each winner and loser portfolio and the difference between them for each subtest.

Table 3.2 reports the CAR for winner and loser portfolio and the difference between them. In the ranking period, the winner portfolio maintained its good performance for three years and outperformed the loser portfolio. The loser portfolio continued its underperformance in relation to the winner portfolio. The difference between the winner and loser portfolio was highest after three years, with a significant return of 148.5 percent, using the equally-weighted portfolio (highest was the second year of the ranking period, with a significant return of 143 percent, using the value-weighted portfolio). In the test-period, winner momentum effect continued to outperform losers, in a one year horizon, by 8.4 percent at equally-weighted and 0.1 percent at value-weighted. These findings support the findings of Richard (1997).

[INSERT TABLE 3.2 HERE]

However, at the two and three year horizon, rank-period losers begin to outperform winners. The three-year horizons show the highest returns to the contrarian strategy, with significant returns of 23 and 17 percent for the equally-weighted and value-weighted portfolio, respectively. The results from using the equally-weighted and value-

weighted portfolio are mostly similar, so the results are not purely due to the high value weighted portfolio of Saudi Arabia, Turkey, Kuwait, and the UAE. Richards (1995) reports similar findings and results. The difference between the findings of the equally-weighted and value-weighted portfolio is that in the value-weighted portfolio both winner and loser have higher returns at the testing-period, and the difference of winner-loser is significant at a two-year horizon in the value-weighted portfolio.

Converting all indices into US$ rather than local currency does not produce different results. Table 3.3 shows the same information as in Table 3.2 with the exception of using US$ rather than local currency for each market. Figure 3.1 shows cumulative abnormal returns for winner and loser value-weighted in US$ for the formation period. In the second year, the winner clearly outperforms the loser portfolio, and the outperformance persists into the third year. The empirical evidence supports the overreaction hypothesis. Figure 3.2 shows cumulative abnormal returns for winner and loser value-weighted in US$ for the testing period. In the second year, the winner clearly underperforms the loser portfolio, and the underperformance persists into the third year.

[INSERT TABLE 3.3 HERE]

[INSERT FIGURE 3.1 HERE]

[INSERT FIGURE 3.2 HERE]

The focus now is on the difference between winners and losers in Test-2, Test-3, and Test-4, after the ranking period. Table 3.4 reports the findings of Test-2 that have two overlapping periods of six years each, three years for each ranking and testing period. The difference in ACAR between winner and loser portfolios after the formation period is for 12, 24, and 36 month horizons. Table 3.4 shows in panel A and B statistically

significant subsequent price reversals at 36 months of the test period. Losers' portfolios outperform winners' with a significant return of 14.6 percent (22% B-H) at the end of 36 months. The findings support similar findings in DeBondt and Thaler and Richards's papers. Figure 3.3 shows losers outperform winners in the third year of the testing period. The empirical evidence supports the overreaction hypothesis.

[INSERT TABLE 3.4 HERE]

[INSERT FIGURE 3.3 HERE]

Table 3.5 reports Test-3, which has three overlapping periods of five years each, two years for ranking periods and three years for testing periods. The difference in ACAR between winner and loser portfolios after the formation period is for 12, 24, and 36 month horizons. Table 3.5 shows statistically significant subsequent price reversals at 36 months of the test period. Losers' portfolios outperform winners' with a significant return of 23.1 percent at the end of 36 months. The findings support similar findings in other studies, and the empirical evidence supports the overreaction hypothesis. In the 12 and 24 month horizons, winners' portfolios continued to outperform losers' portfolios with a significant 6.7 percent after 24 months. The performance of winners and losers reversed dramatically after 24 months in the test period. Using B-H, we find that losers' outperform winners with significant 19.7 percent and the outperforming continues after 36 months. Figure 3.4 shows losers outperform winners in the third year of the testing period. The empirical evidence is consistent with the overreaction hypothesis.

[INSERT TABLE 3.5 HERE]

[INSERT FIGURE 3.4 HERE]

Table 3.6 shows the findings of Test-4, that has two non-overlapping periods of

five years each, two years for ranking periods and three years for testing periods. Unlike the previous tests, Test-4 is the only test that shows inconsistent findings for the overreaction hypothesis. The Table shows the difference in ACAR between winner and loser portfolios, after the formation period, for 12, 24, and 36 month horizons. The results are statistically significant, with no subsequent price reversals at 36 months of the test period. Winners' portfolios continue their outperformance of losers' portfolios, with a significant return of 0.09 percent (t-statistic = 8.61) at the end of 36 months. The findings do not support the overreaction hypothesis. In the 12, 24 and 36 month horizons, winners' portfolios continue to outperform losers' portfolios with a significant 21.7, 11.2, and 0.09 percent after 12, 24, and 36 months, respectively. The performance of winners and losers does not reverse after 24 months in the test period, similar to Test-1, Test-2, and Test-3. Furthermore, the results for both *CAR* and B-H methods have the same results. However, if we looked to the countries in each portfolio we find that winner portfolio have two countries (Kuwait and Saudi Arabia) with strong performance in testing period, at the same time loser portfolio have one country (Lebanon) with negative performance in testing period. Figure 3.4 shows winners outperform losers in all of the testing period. The empirical evidence conflicts with the overreaction hypothesis.

[INSERT TABLE 3.6 HERE]

[INSERT FIGURE 3.5 HERE]

Table 3.7 reports the average cumulative abnormal return difference between winners and losers ($ACAR_{W,t}$ - $ACAR_{L,t}$) after 36 months in the testing period. The table shows January return, February to December return, and all months for Test-2, Test-3,

and Test-4. In every January, winners' portfolios outperform losers' in all tests after 36 months in the test period. Alternatively, losers tend to outperform winners from February to December in all tests, even in Test-4 that is inconsistent with the overreaction hypothesis. Most importantly, the findings of the difference in January are the opposite of DeBondt and Thaler (1995). They find "*extraordinarily large positive excess returns earned by the loser portfolio in January,*" but Table 3.7 shows the difference is for the winners in January. Moreover, these results show only a modest proportion of the total three years' return difference occurs in January. Therefore, unlike winner-loser studies of U.S. stocks, the reversals in this chapter do not appear to be primarily a January phenomenon, which is the same as finding of Richards (1997).

[INSERT TABLE 3.7 HERE]

Whatever the explanation for overreaction, it should be noted that reversals are still observed in national markets, so they cannot be considered a stock phenomenon only.

III.4. CONCLUSION

This chapter explored the potential reversals in the national stock markets over a period of several years. The major results are consistent with the prediction of the overreaction hypothesis that national indices reversals occur after the formation period. In other words, we find consistent results in Test-1, Test-2, and Test-3 that find performance reversals, in testing periods, that support the overreaction hypothesis. Second, the reversals phenomenon occurs during the third year of the testing period. This is consistent with other studies and findings that support the overreaction. Third, only

Test-4, which has two non-overlapping periods, does not yield supporting results for the overreaction hypothesis. On the contrary, winners continued to outperform losers in 12, 24, and 36 month horizons. However, Kuwait and Saudi Arabia had a good performance from the winners, at the same time Lebanon had negative performance from losers' portfolio. Moreover, results show only a modest proportion of the total three years' return difference occurs in January. Finally, size does not seem to produce a difference between winners' and losers' performance.

Table 3.1

Sample period summary (3/1994-2/2004): The sample is divided into four tests

Test	Portfolio sub-periods	Formation Period	Testing Period
1	Six years Daily data	3/1998 - 2/2001	3/2001 - 2/2004
2	Six years overlapping.	3/1994 - 2/1997	3/1997 - 2/2000
		3/1997 - 2/2000	3/2000 - 2/2003
3	Five years overlapping	3/1994 - 2/1996	3/1996 - 2/1999
		3/1996 - 2/1998	3/1998 - 2/2001
		3/1998 - 2/2000	3/2000 - 2/2003
4	Five years non-overlapping	3/1994 - 2/1996	3/1996 - 2/1999
		3/1999 - 2/2001	3/2001 - 2/2004

Table 3.2

Test for winner-loser effects among stock market return indices: Daily data, March 1998 - March 2004 in local currency

Number of years in ranking and test period	Winner Portfolio	Loser Portfolio	Winner-Loser Difference	(*t*-Statistics)
	1. Equally-weighted portfolio			
Ranking-period CAR				
1	0.428	-0.130	0.558	(17.84)*
2	0.621	-0.755	1.376	(26.86)*
3	0.828	-0.657	1.485	(40.59)*
Test-period CAR				
1	0.065	-0.019	0.084	(30.91)*
2	-0.007	0.225	-0.233	(-0.78)
3	0.472	0.703	-0.231	(-14.46)*
	2. Market capitalization-weighted portfolio			
Ranking-period CAR				
1	0.376	-0.078	0.454	(11.66)*
2	0.736	-0.693	1.430	(23.74)*
3	0.762	-0.436	1.198	(38.46)*
Test-period CAR				
1	0.198	0.198	0.001	(13.35)*
2	0.132	0.563	-0.431	(-7.81)*
3	0.766	0.937	-0.171	(-22.13)*

* Significant at 1% level.

Table 3.3

Test for winner-loser effects among stock market return indices: Daily data, March 1998 - March 2004 in US$ currency

Number of years in ranking and test period	Winner Portfolio	Loser Portfolio	Winner-Loser Difference (*t*-Statistics)	
	3. Equally-weighted portfolio			
Ranking-period CAR				
1	0.427	-0.130	0.557	(17.85)*
2	0.619	-0.755	1.374	(26.86)*
3	0.831	-0.658	1.488	(40.57)*
Test-period CAR				
1	0.068	-0.018	0.086	(31.20)*
2	-0.006	0.226	-0.232	(-1.08)
3	0.479	0.704	-0.225	(-14.19)*
	4. Market capitalization-weighted portfolio			
Ranking-period CAR				
1	0.374	-0.078	0.452	(11.63)*
2	0.733	-0.693	1.426	(23.72)*
3	0.768	-0.436	1.204	(38.44)*
Test-period CAR				
1	0.203	0.198	0.005	(14.00)*
2	0.135	0.564	-0.428	(-7.22)*
3	0.778	0.937	-0.159	(-21.56)*

* Significant at 1% level.

Table 3.4

Test-2 of winner-loser effect among stock market return indices (3/1997-2/2003) monthly data in US$ currency

Panel A: ACAR				
ACAR at the end of formation period		W-L Difference (t-Statistics)		
Winner Portfolio	Loser Portfolio	Months after formation period 12	24	36
0.843	-0.148	0.024 (1.86)*	-0.039 (-0.06)	-0.146 (-2.94)**
Panel B: Buy-and-Hold				
B-H at the end of formation period		W-L Difference (t-Statistics)		
Winner Portfolio	Loser Portfolio	Months after formation period 12	24	36
0.631	-0.165	-0.017 (-1.52)	-0.099 (-2.57)*	-0.223 (-5.47)**

* Significant at 10% level.

** Significant at 1% level.

Table 3.5

Test-3 of winner-loser effect among stock market return indices (3/1996-2/2003) monthly data in US$ currency

Panel A: ACAR				
ACAR at the end of formation period		W-L Difference (t-Statistics)		
Winner Portfolio	Loser Portfolio	Months after formation period 12	24	36
0.667	-0.220	0.007 (0.82)	0.067 (2.82)**	-0.231 (-1.83)*
Panel B: Buy-and-Hold				
B-H at the end of formation period		W-L Difference (t-Statistics)		
Winner Portfolio	Loser Portfolio	Months after formation period 12	24	36
0.513	-0.232	-0.103 (-2.78)*	-0.197 (-5.91)**	-0.496 (-6.72)**

* Significant at 10% level.

** Significant at 1% level.

Table 3.6

Test-4 of winner-loser effect among stock market return indices (3/1996-2/2004) monthly data in US$ currency

Panel A: ACAR

ACAR at the end of formation period		W-L Difference (t-Statistics)		
Winner Portfolio	Loser Portfolio	Months after formation period 12	24	36
0.428	-0.328	0.217 (6.33)*	0.112 (11.97)*	0.009 (8.61)*

Panel B: Buy-and-Hold

B-H at the end of formation period		W-L Difference (t-Statistics)		
Winner Portfolio	Loser Portfolio	Months after formation period 12	24	36
0.202	-0.532	-0.037 (-1.91)*	0.145 (5.24)**	0.045 (7.36)**

* Significant at 10% level.

** Significant at 1% level.

Table 3.7

Winner-Loser difference after 36 months of formation period for January and the rest of the year

Test	Jan.	Feb.-Dec.	All Months
2	0.026	-0.172	-0.146
3	0.071	-0.301	-0.231
4	0.049	-0.040	0.009

Figure 3.1
Cumulative Abnormal Returns for winner and loser market capitalization-weighted portfolio (US$) in formation period

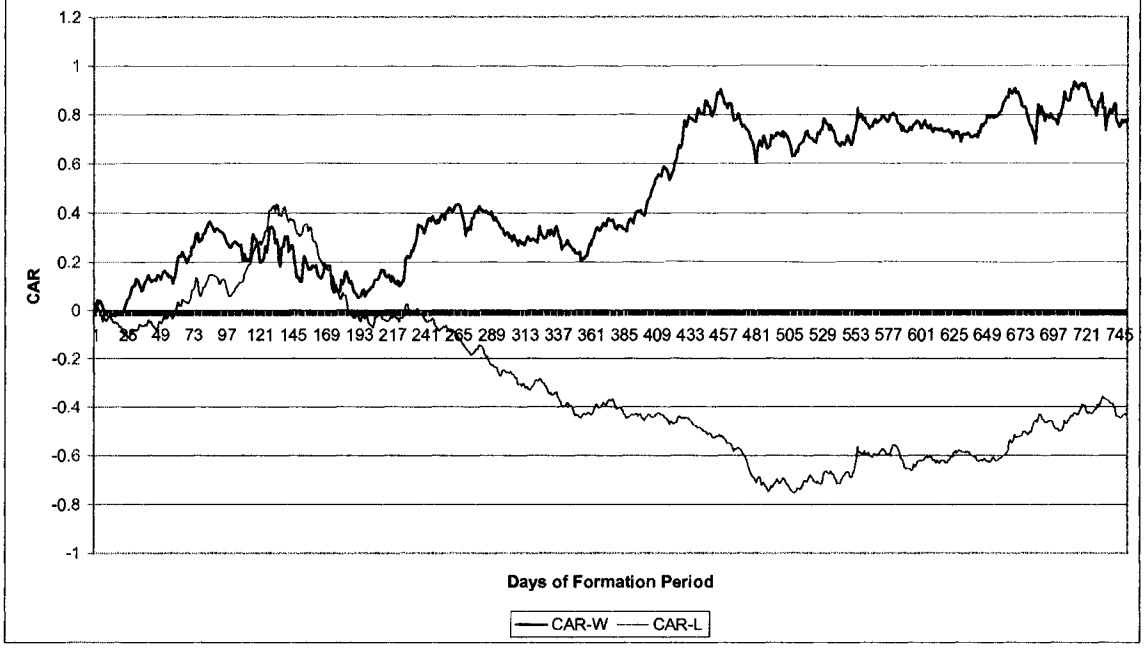


Figure 3.2
Test-1 Cumulative Abnormal Returns for winner and loser market capitalization-weighted portfolio (US$) in testing period

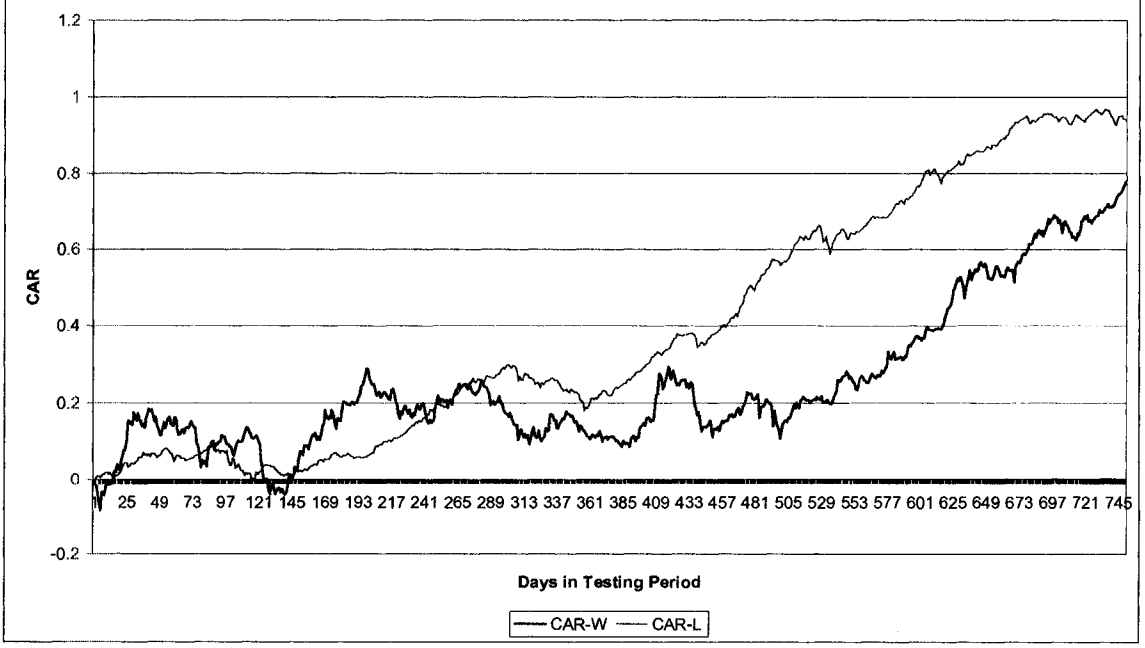


Figure 3.3
Test-2 Average Cumulative Abnormal Returns for winner and loser portfolios

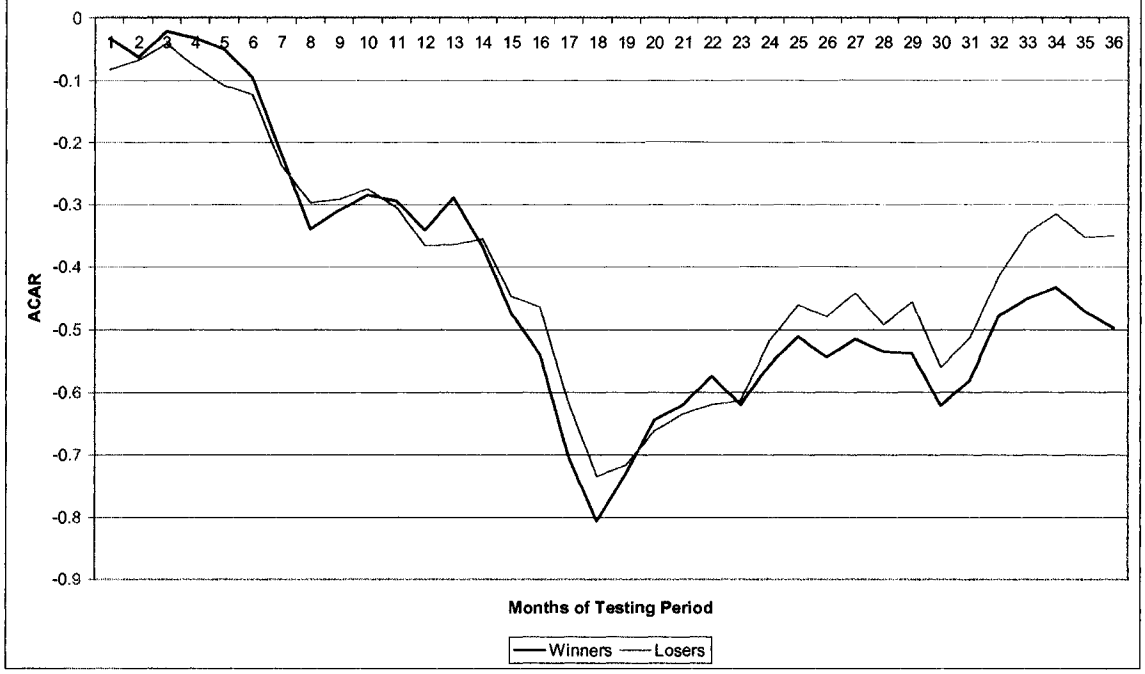


Figure 3.4
Test-3 Average Cumulative Abnormal Returns for winner and loser portfolios

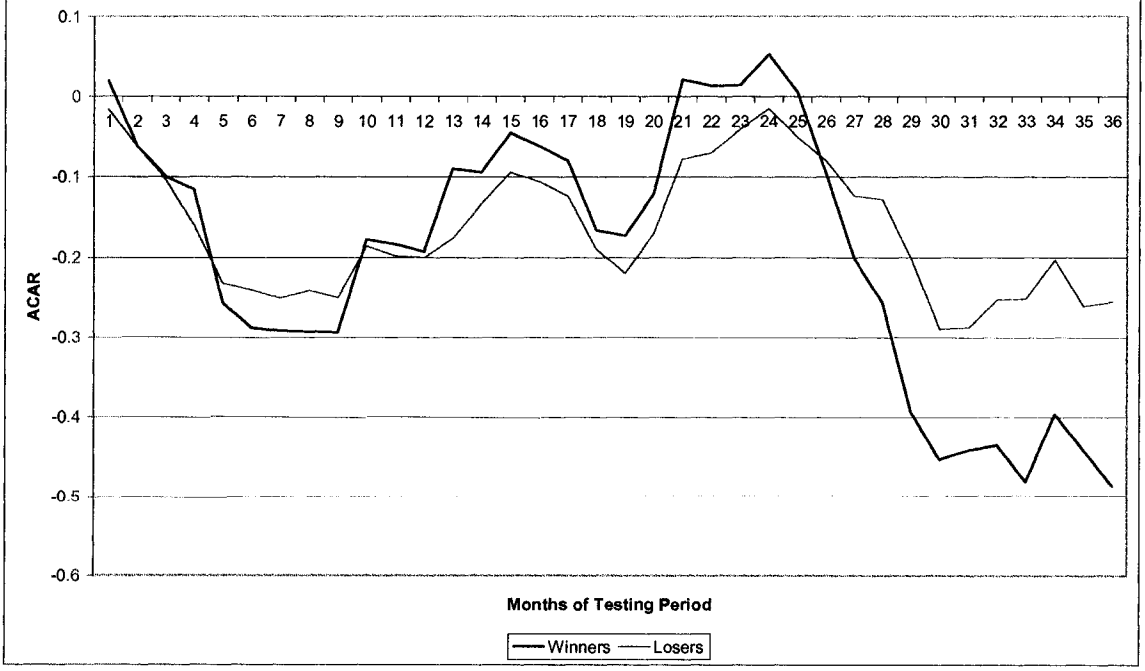
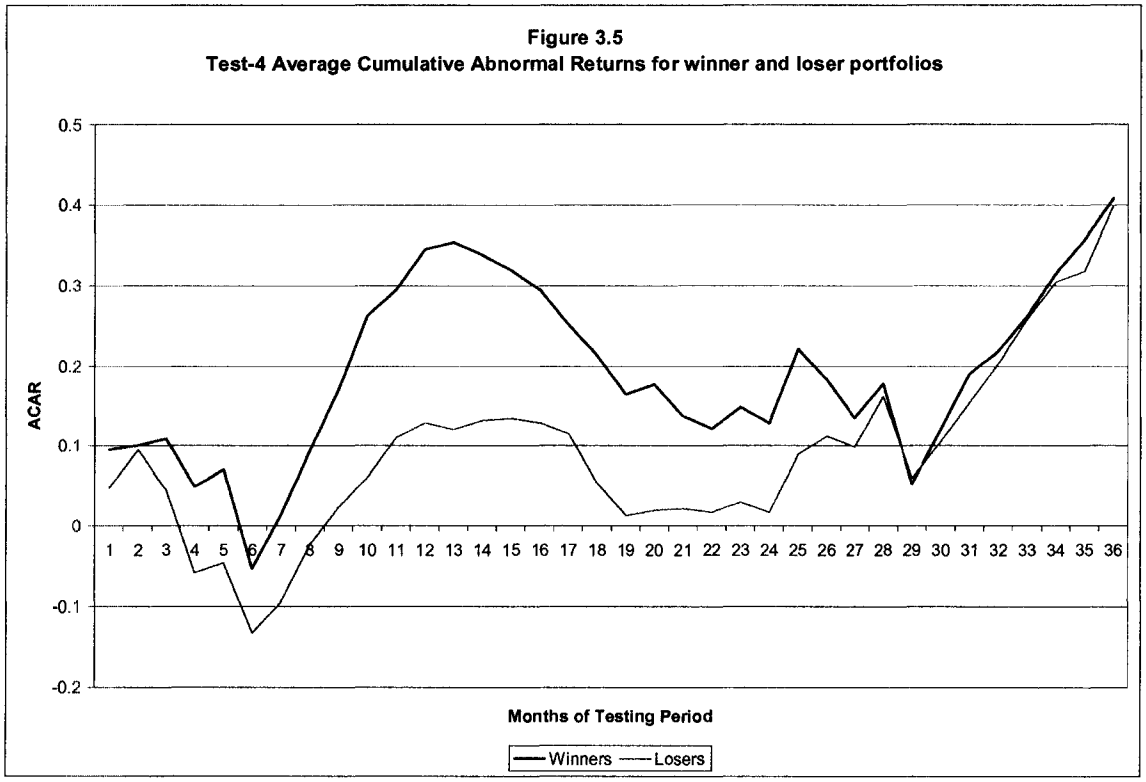


Figure 3.5
Test-4 Average Cumulative Abnormal Returns for winner and loser portfolios



CHAPTER IV

SEASONALITY AND THE JANUARY EFFECT IN MIDDLE EAST AND NORTH AFRICA NATIONAL STOCK MARKETS

IV.1. INTRODUCTION

The seasonal behavior of the stock market has been documented in several studies. Rozeff and Kinney (1976) present evidence on the existence of seasonality in monthly returns on the United States (US) stock market. This seasonality has the highest mean of return in January. Roll (1983) and Keim (1986) report the same finding. This January seasonal is not restricted to US market. Gultekin and Gultekin (1983) and Boudreaux (1995) have reported seasonal monthly effects in several international stock markets around the world, and in this seasonal monthly effect, they find that January effect. Another seasonal behavior of the stock market occurs in the summer and is called the "Sell-in-May effect." Studies have documented that returns in the winter months are much larger than returns in summer months (Bouman & Jachbsen 2002 et al.). Finally, Bhabra, Dhillon, and Ramirez (1999) document the existence of a November[9] effect in the US stock returns and suggest that tax-loss selling is a dominant explanation for the seasonality of stock returns.

The purpose of this study is to investigate the existence of a monthly effect in international stock market returns for the indexes in twelve different countries in the MENA region. It also examines whether stock returns are significantly high in January

[9] According to Bhabra, Dhillon and Ramirez (1999), the November effect was first observed after the passage of Tax Reform Act of 1986. In addition, they show that the January effect in the post-Act period is stronger than in the pre-Act period.

and low during the May-October period. In this study, the investigation of the monthly effect is extended by examining the return patterns of markets that have not been investigated. The countries being studied are Bahrain, Egypt, Jordan, Kuwait, Lebanon, Morocco, Oman, Qatar, Saudi Arabia, Tunisia, Turkey, and United Arab Emirates (UAE). The results of this study should have important implications for financial mangers and investors interested in international diversification.

This chapter is organized as follows. In section 2, I present the literature review. Section 3 discusses the data and methodology I will use, and in section 4, I present the empirical results. Finally, in section 5, I will conclude with the summary.

IV.2. LITERATURE REVIEW

IV.2.A. January Effect

Various hypotheses have been proposed to explain the January effect. These include tax-loss selling and window-dressing[10] by portfolio managers. Both hypotheses predict that stocks that are losers by late fall will likely continue losing in December but will have high returns in January. While these possible explanations have been offered, empirical support for them can be described as mixed.

As suggested by Thaler (1987), an empirical result is anomalous if it is difficult to rationalize or if implausible assumptions are necessary to explain it within the paradigm. Research motivated by a possible explanation to the anomaly of the January effect based

[10] The window-dressing hypothesis contends that institutional investors want to sell losers and buy glamorous winners to prepare for their year-end reporting. Such buying and selling create positive price pressure on winners and downward pressure on losers in the period before the turn of the year. As the selling by institutions stops at year-end, prices for the loss stocks rebound in January, producing large positive returns for last year's losers. This effect can be more pronounced for small stocks because of their low liquidity and high market impact cost.

on tax-loss-selling[11]. The explanation cannot explain the January effect completely, since the anomaly will not be observed in a country with on taxes or in periods before the relevant tax existed.

The argument is that prices of firms, which have previously declined, will decline further in the later months of the year as owners sell off the shares to realize capital losses. Then, after the new year, prices bounce up in the absence of selling pressure. The merits of this argument are not based on rational behavior by all market participants; Roll (1983) points out that even if some investors were motivated by taxes to trade in this manner, other investors could buy in anticipation of the excess returns in January[12].

Brauer and Chang (1990) found that portfolios of fund shares earn a rate of return over the first four weeks of the year that exceed the average four-week rate of return over the rest of the year. They points out that information-based[13] arguments cannot explain the January phenomenon, and even though tax-loss selling may not be the only source of the January seasonal, it does seem to be one source.

Several researchers have examined seasonal patterns in other countries to investigate the tax-loss-selling hypothesis, and whether the January returns might be merely a statistical artifact (Thaler 1987). Gultekin and Gultekin (1983) empirically examined the stock market seasonality in major industrialized countries. They investigated the seasonal pattern in sixteen countries and found that January returns were

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[11] The tax-loss selling hypothesis argues that there is a downward pressure on the prices of those stocks which have declined during the year as investors attempt to realize their losses against their taxable income. After the end of the tax-year, prices pressure disappears and the prices reach equilibrium level. Thus, we observe abnormally large returns at the turn of the tax-year.

[12] Richard Roll reports that stocks with negative returns over the previous year have higher returns in January.

[13] Others have suggested that the January effect is due to the new information provided by the firms 'information hypothesis' or 'earnings information'. Peterson (1990) point out that it is not likely that earnings information seasonality is the primary cause of seasonality in stock index return.

exceptionally large in fifteen of them, and seasonality in these countries is not a size-related anomaly. In fact, the effect in the US is smaller than in many other countries. In Belgium, the Netherlands, and Italy, the January return exceeds the average return for the whole year.

While taxes seem relevant to the January effect, international evidence also suggests taxes are not the entire explanation. First, the January effect is observed in Japan where no capital gains tax or loss offsets exist, and good months in Japan are December-January and June-July. These periods coincide with the large semiannual bonuses most workers receive (Kato and Schallheim 1985). Second, the United Kingdom (UK) and Australia have January effects, even though their tax years begin on April 1 and July 1, respectively[14]. Furthermore, returns are high in April in the UK and in July in Australia, so taxes do seem to be part of the story (Jegadeesh 1991 and Clare, Psaradakis, and Thomas 1995). Finally, Canada had no capital gains tax before 1972 yet did have a January effect before 1972 (Berges, McConnell, and Schlarbaum 1984).

January is special in other ways, as some studies find the January effect in overreaction and risk premium topics. DeBondt and Thaler (1985) have found that firms, which have been winners or losers over a five-year period, subsequently have excess returns in the opposite direction. The excess returns, especially for the losers, are concentrated in January.

Tinic and West (1984) reevaluated the CAPM to see whether risk premiums have seasonal patters. They find the observed return for riskier (higher β) stocks occurs in January. In all other months, riskier stocks do not earn higher returns. Keim (1986)

[14] Some have pointed out that January effects in countries with no capital gains tax could be explained by trading by non-citizens who are subject to January-based tax. However, little evidence supports this claim.

reports two anomalous results. Among those firms that pay positive dividends, returns increase with the dividend yield. The highest returns are associated with the firms that pay no dividends. The excess returns in both the high dividend and zero dividend groups are concentrated in January.

Corhay, Hawawini, and Michel (1987) have found evidence of seasonality in the Fama and MacBeth estimate of the CAPM-based risk premium for stock exchanges (NYSE, London, Paris, and Brussels exchanges). In addition, they found that risk premium are positive in January and negative the rest of the year in Belgium and France. In U.K., there is no January seasonal in risk premium, instead a positive April seasonal and a negative average risk premium over the rest of the year is found, whereas the average stock returns are significant and positive in January and April. In the U S, the pattern of risk premium seasonality coincides with the pattern of stock return seasonality. Both are positive and significant in January.

IV.2.B. Sell-in-May Effect

The strategy based on "sell in May and walk away" Sell-in-May effect remains profitable for many countries (Bouman and Jacobsen 2002). According to the Sell-in-May effect, the strategy is based on selling in May since May signals the start of a bear market, so investors are better off selling their stocks in May and buying again in October. This anomaly is related to the duration of the summer holiday.

At the end of April and the beginning of May, many US, European, and even Middle Eastern financial media refer to an old saying "Sell in May, then walk away"; even in 2005, the financial press referred to that old saying. Some illustrative financial

press quotes about Sell-in-May have come from CBS MarketWatch.com in May 21, 2003:

> The stock market just lost the final vestiges of its seasonally favorable period. I'm referring to the six months between Halloween and May in which the lion's share of the stock market's historical returns have been concentrated. If advisers were to have followed this seasonal pattern in its original form, they would have gotten out of stocks at the end of April. After all, the system is referred to as "Sell in May and go away."[15]

Assuming market efficiency, there are reasons to assume that market returns in the period of May to October would be significantly different from November to April. Nevertheless, despite the fact of the market efficiency hypothesis, the press in April or May reports year after year the "Sell in May and go away" advice. Moreover, even the Middle Eastern press started reporting the "Sell in May and go away" this year.

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[15] The quote by Mark Hulbert, CBS.MarketWatch.com, 5/31/2003. And some illustrative quotes:

- CNN/Money report in April 30, 2004: "Living by the old Wall Street saw, "Sell in May, then walk away," isn't always the wisest way to manage your portfolio -- but this year, the adage might prove to be true. Since May 1945, on average, stocks in the S&P 500 have gained some 7.2 percent between the months of November and April, according to Standard & Poor's chief investment strategist, Sam Stovall. When the weather warms up, though, traders apparently head for the beach. Stocks have gained just 1.5 percent between the months of May and November. Thus the old saw." By Mark Gongloff, senior writer, CNN/Money, 4/30/2004.
- The same report in the following year in the May 4, 2005 in *BusinessWeek:* "Stock-price movements historically have been stronger in the November-April period, compared to the May-October stretch. The message implicit in the old market chestnut is that investors move into cash in May, steering clear of a typically weak period for equities, and back into stocks in November, when prices usually begin to bounce back. A survey of the S&P 500 stock index's price action from May 1945 through April 2005, shows the old saying may have some merit-but it doesn't necessarily hold true for every segment of the market ...while the S&P 500 advanced an average of 7% during the November-April period over that span, it posted an average gain of only 1.5% from May through October... November-April period outperformed May-October 69% of the time." By Sam Stovall, sector watch from S&P, *BusinessWeek* , 5/4/2005.
- AME Info Market Watch report on May 5, 2005: "Thus regional investors who 'sell in May and go away' will probably find themselves delighted at the wealth that they have preserved while others hang around to learn, once again, that what goes up must come down." By James McInerney, News Editor, AME Info Market Watch, 5/5/ 2005, AME Info is the Middle East business resource, http://www.ameinfo.com/

Bouman and Jacobsen (2002) tested the existence of a Sell-in-May effect in 37 developed and emerging markets. They tested whether stock market returns would be higher in the November-April period than in the May-October period. The findings support the market wisdom in Sell-in-May in 36 of 37 markets. The Sell-in-May effect tends to be strong in European countries and robust over time. The evidence shows that in the UK, the effect has been noticeable since 1694. The authors examined a number of possible explanations, but none of them explains the puzzle fully.

Marquering (2002) focuses on seasonal predictability of stock market returns using monthly stock market returns from Belgium, Germany, the Netherlands, the UK and the US. He finds strong support for the Sell-in-May effect, which implies that for each country, the returns are on average significantly higher in the winter than in the summer.

The focus of this study is to find if the MENA stock market has any monthly seasonality and to test for the January effect and the Sell-in-May effect by using calendar dummies.

IV.3. DATA AND METHODOLOGY

To examine the seasonality in capital markets, I use the sample period from January 1995 to December 2004 for estimation and testing, using monthly data. The 10-year horizon provides 120 monthly observations, enough to allow for a reliable parameter estimation in the seasonal testing. The monthly stock return of the twelve MENA market

indices, as shown in Table 4.1 in this study, were obtained from Global Finance Data[16] and local markets. All series are expressed in local currencies.

[INSERT TABLE 4.1 HERE]

Indices form MENA's 12 markets are used to obtain returns. The method of calculating the returns, $R_{it,}$ for each of the 12 countries from January 1995 to December 2004 follows:

$$R_{it} = \ln\left(\frac{P_{it}}{P_{it-1}}\right), \tag{4.1}$$

where P_{it} is the closing price for each country's index i at time t.

I first investigate the existence of seasonality in MENA's capital market. In this study, I will have three tests: the first test is non-parametric and is used to test if we have differences in the month-to-month mean returns. The second test is to test for the January effect, and the third test is to test the Sell-in-May seasonal effect in stock returns.

IV.3.A. Seasonality

Seasonality, as shown in other studies, implies that there are significant differences in the month-to-month mean returns. I used a non-parametric test developed by Kruskal and Wallis (K-W). The K-W procedure is used to test the hypothesis that all 12 of the samples are drawn from the same population. Specifically, I tested the hypothesis that the 12 months have identical means.

To test the existence of seasonality I use τ; for each country, I test the null hypothesis that

$$H_0 : \tau_1 = \tau_2 = ... = \tau_{12} = 0, \tag{4.2}$$

[16] Global Finance Data, http://www.globalfindata.com/

against the alternatives that all τ 's are not equal. Rejection of the null hypothesis implies that stock returns in a given country exhibit seasonality. Since this procedure uses the rankings of the observations, it is not sensitive to outliers. Furthermore, the K-W test requires no distributional assumptions about the index returns.

IV.3.B. January Effect

To examine whether the January effect anomaly is statistically significant in the market sample and has significant forecasting power, I use the following equation:

$$R_t = a_0 + a_1 Jan_t + \varepsilon_t \qquad (4.3)$$

where Jan_t is a dummy for the month January: 1 for observations relating to the month January, and 0 for observations from the other months. I test whether the coefficient of Jan_t is significantly different from zero. When a_1 is significant and positive, this rejects the null hypothesis of no January effect. In that case, the mean returns in January are on average significantly higher than other months.

IV.3.C. Sell-in-May Effect

To examine whether the Sell-in-May effect anomaly is statistically significant in the market sample and has significant forecasting power, I use the following equation:

$$R_t = b_0 + b_1 S_t + \varepsilon_t \qquad (4.4)$$

where S_t is a dummy for the Sell-in-May effect: 1 for observations relating to the period from November to April, and 0 for observations from the other months. I test whether the coefficient of S_t is significantly different from zero. When b_1 is significant and positive, this rejects the null hypothesis of no Sell-in-May effect. In that case, the mean returns in the period from November to April are on average significantly higher than other months.

IV.4 EMPIRICAL RESULTS

Table 4.2 presents month-to-month mean returns on the MENA market indices. An inspection of this table reveals substantial variation in the monthly returns. The tests of equality of month-to-month mean returns are shown in the last two rows of Table 4.2. These two rows present the K-W test statistics and the significance levels at which the null hypothesis in (4.2) can be rejected. The test statistics show that seasonality exists in four MENA securities markets. The null hypothesis that stock returns are time invariant is rejected for four countries from a total of twelve at the 10% significance level.

[INSERT TABLE 4.2 HERE]

We find from Table 4.2 that seasonality exists in Bahrain, Lebanon, Qatar, and Turkey only. This provides evidence for seasonality in the index rates of return, in that at least one of the population distributions from which the samples are drawn differs from some of the rest.

In order to find the months that are responsible for the results, I conducted two tests for the January effect and the Sell-in-May effect. Table 4.3 reports the results for equation (4.3), which tests for the January effect. I tested whether the coefficient of Jan_t is significantly different from zero. When a_1 is positive and significant, we reject the null hypothesis of no January effect. In that case, the mean returns in January are on average significantly higher than other months.

[INSERT TABLE 4.3 HERE]

[INSERT FIGURE 4.1 HERE]

In Table 4.3, we find only one positive significant January return: for Egypt. However, Bahrain has a significant January return but a negative return, which is contradictory to the January effect wisdom. Moreover, Egypt, which shows a positive significant January return, does not have any taxes on stock trading.

To examine strategies based on the Sell-in-May effect, I reported the average returns in Figure 1 for the periods May-October and November-April, and the whole year for each country. As can be seen in Figure 1, the differences in returns in the two half-year periods are mixed. The strategy of selling in May is not working for each country. The markets that show a working sell-in-May strategy are Egypt, Morocco, and Turkey.

Therefore, we have to ask whether these results are risk-related or not. Does a higher return during the period November-April indicate a higher risk in this period? Risk, measured by the standard deviation, tends to be smaller than the higher change in return. Table 4.4 illustrates annualized risk and returns in the two sub-periods.

[INSERT TABLE 4.4 HERE]

Table 4.4 reveals some interesting insights. While returns differ considerably in some markets, the standard deviation differs less. In Morocco and Turkey, the standard deviation is higher in November-April than it is during May-October, but the difference is marginal. For instance, in the Turkish market, investors would require an additional risk premium of more that 38% to compensate for an increase in the standard deviation of 11%. In the Moroccan market, investors would require an additional risk premium of 12.8% to compensate for an increase in the standard deviation of 6.8%. Moreover, Egyptian market investors would gain 11% in the November-April period over May-October period; at the same time, the standard deviation is less by 6.5%. However,

Bahraini market investors would gain 11% more in the summer (May-October), and the standard deviation would be higher in the summer by 6%.

[INSERT TABLE 4.5 HERE]

To examine if strategies based on the Sell-in-May effect have significant forecasting power for monthly returns, I use equation (4.4), and we can see the results in Table 4.5. In Table 4.5, I report the summary statistics and estimation results from equation (4.4) that test for Sell-in-May effect. I test whether the coefficient of S_t is significantly different from zero. The b_1 denotes the average monthly return in the period November-April. When b_1 is positive and significant, we reject the null hypothesis of no Sell-in-May effect. In that case, the mean returns in November-April period are on average significantly higher than other months. Table 4.5 shows that in 2 of the 12 countries there is a positive statistically significant Sell-in-May effect present at the 5% level. Only Morocco and Turkey show the significant Sell-in-May effect present in the 12 countries. However, the results show, at the same time, 2 of 12 countries have a negative statistically significant Sell-in-May effect. Contrary to the Sell-in-May effect, both Bahrain and UAE have a negative return in the winter and have a positive significant return in the summer. Moreover, Bahrain shows the negative effects of both January and Sell-in-May that is contrary to the wisdom of January and Sell-in-May effects. In addition, from Table 4.5, we find that all GCC countries with the exception of Oman have significant positive return in the summer rather than negative return. The results contradict the sell in May wisdom that winter returns are higher than summer returns.

IV.5. CONCLUSIONS

In this chapter, we used both parametric and non-parametric methods to investigate seasonality in 12 Middle East and North Africa stock markets. Employing ten years of data, three tests are studied: seasonality, the January effect, and Sell-in-May effect. In general, I find that only four of the 12 MENA stock markets experience seasonal monthly returns: Bahrain, Lebanon, Qatar, and Turkey. The January effect is present in only two of the 12 MENA markets: Bahrain and Egypt. However, Bahrain has a negative significant return in the month of January.

Finally, testing for the Sell-in-May effect, I find that only Morocco and Turkey have a positive significant return using the selling in May strategy. However, MENA stock markets do not show the same pattern as US and European markets. As we have seen, some markets contradict both the January and the Sell-in-May effects. Bahrain and UAE have a significant positive return in the summer and a negative return in winter. Furthermore, all GCC countries with the exception of Oman have significant positive return in the summer rather than negative return.

Table 4.1 The Indices for each market.

Bahrain	Bahrain SE General Index
Egypt	Cairo SE EFG General Index
Jordan	Jordan AFM General Index
Kuwait	Kuwait Global General Index
Lebanon	Lebanon SE Price Index (LISPI)
Morocco	Morocco Upline Securities Index
Oman	Muscat Stock Market General Index
Qatar	Qatar SE Index
Saudi Arabia (SA)	Saudi Arabia SE Index
Tunisia	Tunisia Indice BVM
Turkey	Istanbul SE IMKB-100 Price Index
United Arab Emirates (UAE)	United Arab Emirates SE Index

Note: Data source from Global Finance Data and markets.

Table 4.2 Month to month mean stock market returns and monthly mean returns and standard deviation over all months for every country from January 1995 to December 2004. All returns measured as percentage. The *t*-values reported in parentheses for each month **Significant at 5% level and *Significant at 10% level.

Month\Country	Bahrain	Egypt	Jordan	Kuwait	Lebanon	Morocco	Oman	Qatar	SA	Tunisia	Turkey	UAE
January	-1.94	5.88	1.02	0.80	-4.34	1.72	3.06	1.15	0.36	2.99	8.14	3.61
	(-1.921)*	(1.388)	(0.948)	(1.429)	(-3.014)**	(1.006)	(2.060)*	(0.793)	(0.435)	(1.342)	(1.488)	(3.000)**
February	-3.46	-1.83	0.00	0.84	-14.04	3.74	-0.97	0.34	-0.79	1.06	3.99	-1.15
	(-3.857)**	(-0.731)	(0.005)	(1.061)	(-2.453)**	(1.853)*	(-0.612)	(0.119)	(-0.618)	(0.520)	(0.682)	(-1.874)*
March	0.09	-0.31	-1.84	-0.58	-0.28	1.27	1.13	2.57	1.70	1.35	3.97	-0.13
	(0.103)	(-0.166)	(-2.155)*	(-0.342)	(-0.124)	(0.648)	(0.459)	(0.864)	(1.011)	(1.447)	(0.905)	(-0.191)
April	1.71	1.41	0.20	1.93	-1.74	1.97	-0.86	3.64	2.61	-0.17	10.94	-0.31
	(1.821)	(0.606)	(0.145)	(1.192)	(-0.344)	(0.962)	(0.437)	(1.359)	(1.461)	(-0.065)	(1.945)*	(-0.332)
May	1.04	-1.49	3.32	3.31	11.27	-0.90	0.96	4.39	1.53	0.58	-5.59	0.46
	(1.368)	(-0.653)	(2.814)**	(3.823)**	(2.367)**	(-0.540)	(0.462)	(1.365)	(1.230)	(0.466)	(-2.189)*	(0.313)
June	1.16	-2.03	-0.27	1.45	1.89	0.34	1.37	1.13	2.43	-0.65	2.01	1.88
	(1.691)	(-1.089)	(-0.227)	(1.219)	(0.486)	(0.245)	(0.809)	(0.448)	(1.311)	(-0.375)	(0.680)	(1.463)
July	2.14	-1.74	1.11	0.98	-6.58	-2.20	2.12	4.63	2.71	2.90	2.00	2.56
	(2.000)*	(-0.696)	(0.855)	(0.877)	(-1.076)	(-1.747)	(0.974)	(3.400)**	(1.960)*	(1.863)*	(0.694)	(1.744)
August	2.47	2.11	0.49	1.85	-0.55	3.75	-0.53	4.47	3.88	0.87	-7.41	2.28
	(1.873)*	(0.847)	(0.508)	(2.631)**	(-0.126)	(4.186)**	(-0.230)	(3.509)**	(2.921)**	(0.608)	(-1.405)	(2.537)**
September	0.42	3.28	1.28	1.32	-0.69	-0.69	1.03	-3.55	0.43	-0.22	0.64	2.38
	(0.252)	(1.124)	(1.051)	(0.695)	(-0.172)	(-0.632)	(0.832)	(-2.362)*	(0.270)	(-0.137)	(0.117)	(1.319)
October	1.85	0.66	0.58	1.25	-0.29	-2.64	-1.57	-1.08	0.45	-0.84	11.78	-0.16
	(0.996)	(0.339)	(0.357)	(0.773)	(-0.095)	(-1.304)	(-1.466)	(-0.445)	(0.247)	(-0.470)	(4.612)**	(-0.079)
November	0.03	2.94	3.39	0.11	0.01	0.39	0.95	4.81	1.68	-1.02	2.67	1.30
	(0.036)	(1.196)	(1.608)	(0.082)	(0.002)	(0.303)	(0.532)	(3.140)**	(0.822)	(-0.914)	(0.391)	(0.675)
December	1.47	3.64	1.56	0.34	5.39	1.37	-0.18	3.68	1.55	-0.33	12.04	2.13
	(2.076)*	(2.109)*	(1.933)*	(0.291)	(1.340)	(1.036)	(-0.098)	(2.175)*	(1.748)	(-0.316)	(1.800)	(1.162)
Mean (%)	0.58	1.04	0.90	1.13	-0.83	0.67	0.68	2.07	1.54	0.54	3.76	1.56
Std. Dev. (%)	3.75	7.95	4.04	3.97	13.30	5.21	5.70	5.57	4.74	5.19	16.07	5.61
K-W tests [a]												
Stat.	23.71[b]	11.09	14.28	7.91	17.87[b]	17.06	8.84	17.97[b]	8.53	11.12	19.11[b]	15.04
Prob.	0.014	0.436	0.218	0.722	0.085	0.106	0.637	0.082	0.666	0.433	0.059	0.181

[a] The Kruskal-Wallis test statistic is approximately distributed as chi-square with 11 degree of freedom. It tests the null hypothesis that month-to-month mean returns are equal against the alternative that they are not. Critical value for the chi-square distribution with 11 degrees of freedom at 10% significance level is 17.27. probability value is the probability that a chi-square statistic is at least as large as the one reported would be realized if the null hypothesis is true i.e., mean returns are equal. [b] Indicates the rejection of the null hypothesis that mean returns are equal at 10% significance level or less.

Table 4.3 January effect. Results of estimating equation (4.3) using the returns of market indices. The *t*-values are reported in parentheses.

Explanatory Variables	**Bahrain**	**Egypt**	**Jordan**	**Kuwait**	**Lebanon**	**Morocco**	**Oman**	**Qatar**	**SA**	**Tunisia**	**Turkey**	**UAE**
Constant	0.008	0.006	0.009	0.012	-0.005	0.006	0.005	0.021	0.017	0.003	0.034	0.010
	(2.306)**	(0.809)	(2.307)**	(3.059)**	(-0.382)	(1.165)	(0.868)	(3.220)**	(3.650)**	(0.655)	(2.196)**	(1.788)*
January	-0.028	0.053	0.001	-0.004	-0.038	0.011	0.026	-0.010	-0.013	0.027	0.048	0.026
	(-2.258)**	(2.032)**	(0.098)	(-0.273)	(-0.825)	(0.662)	(1.381)	(-0.418)	(-0.824)	(1.563)	(0.898)	(1.306)
R^2	0.041	0.034	0.000	0.001	0.006	0.004	0.016	0.002	0.006	0.020	0.007	0.014
Adj. R^2	0.033	0.026	-0.008	-0.008	-0.003	-0.005	0.008	-0.011	-0.003	0.012	-0.002	0.006

** Significant at 5% level.
* Significant at 10% level.

Table 4.4 Risk and return for the year, November-April (winter) period and May-October (summer) period measured by annualized mean and standard deviation.

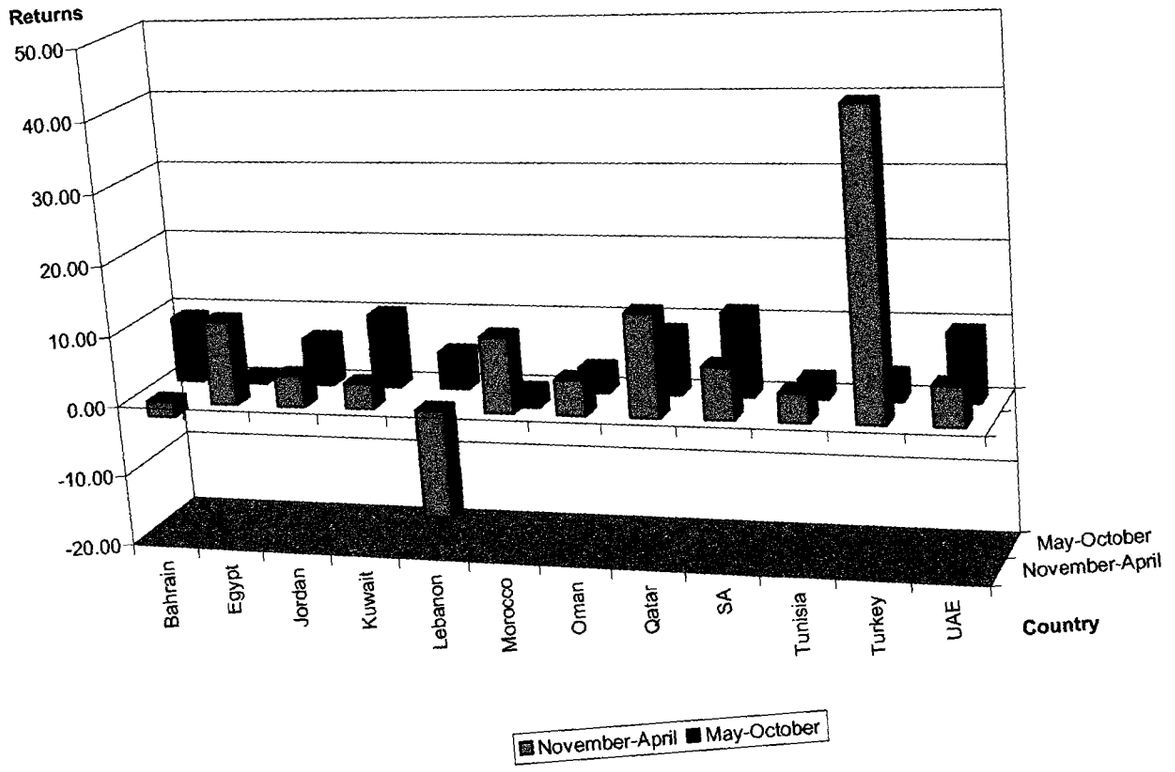
Countries	January-December		November-April		May-October	
	Mean (%)	Std. Dev. (%)	Mean (%)	Std. Dev. (%)	Mean (%)	Std. Dev. (%)
Bahrain	6.99	18.26	-2.09	7.70	9.08	13.58
Egypt	12.54	45.49	11.74	21.02	0.79	27.52
Jordan	10.85	21.11	4.34	10.77	6.50	12.41
Kuwait	13.61	22.99	3.45	15.58	10.16	10.78
Lebanon	-9.96	42.90	-15.00	34.29	5.04	26.99
Morocco	8.11	21.28	10.45	18.80	-2.35	12.00
Oman	8.24	40.87	4.86	19.71	3.38	22.92
Qatar	22.72	23.15	14.06	21.17	8.66	12.33
SA	18.56	26.21	7.12	15.43	11.43	15.21
Tunisia	6.53	30.33	3.89	17.05	2.65	14.49
Turkey	45.18	67.68	41.75	47.30	3.43	36.37
UAE	14.84	22.80	5.44	13.08	9.41	14.17

Table 4.5 Sell in May strategy. *S* is dummy variable that take 1 from November to April and 0 otherwise. Results of estimating equation (4.4) using the returns of market indices. The *t*-values are reported in parentheses.

Explanatory Variables	**Bahrain**	**Egypt**	**Jordan**	**Kuwait**	**Lebanon**	**Morocco**	**Oman**	**Qatar**	**SA**	**Tunisia**	**Turkey**	**UAE**
Constant	0.015	0.001	0.011	0.017	0.008	-0.004	0.006	0.010	0.019	0.004	0.006	0.022
	(3.210)**	(0.129)	(2.070)**	(3.319)**	(0.466)	(-0.591)	(0.762)	(1.710)*	(3.105)**	(0.655)	(0.280)	(2.881)**
S	-0.019	0.018	-0.004	-0.011	-0.030	0.021	0.002	0.006	-0.007	0.002	0.064	-0.020
	(-2.793)**	(1.259)	(-0.486)	(-1.550)	(-1.309)	(2.280)**	(0.235)	(0.754)	(-0.827)	(0.217)	(2.212)**	(-1.799)*
R^2	0.062	0.013	0.002	0.020	0.014	0.042	0.000	0.005	0.006	0.000	0.040	0.027
Adj. R^2	0.054	0.005	-0.006	0.012	0.006	0.034	-0.008	-0.004	-0.003	-0.008	0.032	0.018

** Significant at 5% level.
* Significant at 10% level.

Figure 4.1 MENA Markets: Average Returns in May-October (Summer) and November-April (Winter) in several markets from January 1995 to December 2004



CHAPTER V

RELATIONSHIP BETWEEN EQUITY INDICES ON MIDDLE EASTERN AND NORTH AFRICAN STOCK MARKETS

IV.1. INTRODUCTION

Economic integration among economies of the world has brought increased attention of investors and academic to study the relationship among these markets. Globalization is likely to enhance international linkages between financial markets with communications improvement and lower trade barriers. While integration in financial markets provides advantages, it also offers potential pitfalls. The October 1987 crash of US financial market led to gloom in financial markets around the world. In addition, the financial crisis in Thailand rapidly spread to Indonesia, Malaysia, the Philippines, and Korea. In mid-1998, the East Asian crisis became a worldwide financial and economic crisis hitting developing economies.

Many researchers have investigated the short-term and long-term relationship among worldwide financial markets. The primary focus of the empirical research has been relationship among the G-7 and other industrialized countries financial markets. McCarthy and Najand (1995) study the association in return between the major stock markets indices in the world. The authors find that S&P 500 index has an important influence on Canada, Germany, Japan, and UK stock markets, but not the reverse. Swanson (1987) suggests that world stock markets are becoming more integrated. For developed countries this might be true, but to what extend this might be for stock markets in developing countries.

In recent years, new equity markets have emerged in Asia, Latin America, Europe, Africa and the Middle East. The foreign investors know little about these markets other than high-expected returns. Correlations of these markets can help global and local investors with their investment decisions if they participate to lower their risk by diversification in their portfolio. However, the correlations of these equity returns are unknown for some markets. Nevertheless, a few studies have investigated the relationships among MENA stock markets.

The MENA countries have started successive privatizations and liberalization of foreign ownership. In addition, as it was discussed in chapter 2, we find large differences in the characteristic among these equity markets. Linkages among developed stock market have been studies since the 1970s. However, a few studies have examined the relationship between the emerging financial markets in the MENA region.

The purpose of this chapter is to investigate the existence of relationship between international stock market returns for twelve different countries' indexes in MENA region. In this study, I investigate the relationship between MENA market indexes using daily returns for markets that have not been investigated before. The countries being studied are Bahrain, Egypt, Jordan, Kuwait, Lebanon, Morocco, Oman, Qatar, Saudi Arabia, Tunisia, Turkey and UAE. The results of this study should have important implications for financial mangers, and investors interested in international diversification.

This chapter is organized as follows. In section 2, I present the literature review. Section 3 discusses the data and methodology I will use, and in section 4, I present the empirical results. Finally, in section 5, I will conclude with the summary.

IV.2. LITERATURE REVIEW

Studies of world capital markets have typically focused on the merits of diversification, the lead relationship and comovement of equity prices among market indices. On that note, many studies have focused on the movement of world exchange indices during a worldwide financial crisis. On that topic, Hilliard (1979) examines the structure of international equity market indices during the period from July 7, 1973 to April 30, 1974. This period included an event of significant impact the OPEC embargo that announced on October 18, 1973. The study was on 10 world exchanges of Amsterdam, Paris, London, Milan, Frankfurt, New York, Sydney, Tokyo, Toronto, and Zurich. The author finds that most inter-continental prices move simultaneously, and most do not seem to be closely related with the exception of New York-Amsterdam.

Many researchers have investigated the relationship among worldwide financial markets and the primary focus of the empirical research has been relationship among the industrialized countries financial markets. Most advanced economies deregulated their capital markets, removed barriers to international investment, and improved the accessibility to information. McCarthy and Najand (1995) study the existence and direction of the causal relationship between international stock markets and if any stock market are more likely to lead other major stock markets. The authors used state space procedure to test for the best relationship among major stock indices for Canada, Germany, Japan, US, and UK. They used state space procedure that allows testing for the direction and strength of the linkage between the stock markets using daily stock returns for 14 years. The study concluded that US stock market exerts the most influence

on the other countries as reflected by significant lagged and contemporaneous returns in the US explaining returns on other countries, and US influenced by the UK stock market. Furthermore, Hamao, Masulis, and Ng (1990) observed evidence of price volatility spillovers from New York to Tokyo, London to Tokyo, and New York to London, but no price volatility effects in other directions.

Friedman and Shachmurove (1997) used Vector Autoregression (VAR) model for daily stock market returns for eight major European countries. The model used to investigate the dynamic linkages among the various markets. The author found large European stock markets (Britain, France, Germany, and the Netherlands) are highly related, but the smaller European markets are more independent. However, the impulse response analyses indicate that although innovations are transmitted from some markets to others, most of the responses vanish within one or two days. They found that Britain is a leading market that effects France, the Netherlands, and Germany.

It is known that emerging stock markets are characterized by high volatility. Simultaneously, global and local events can cause a major shift in emerging markets' volatility. The financial turmoil that struck Asia in 1997 was agent of both crisis and panic. Aggarwal, Inclan, and Leal (1999) study the kinds of events that cause large shifts in the volatility of emerging stock market. The authors used iterated cumulative sums of squares algorithm to identify the points of shocks and sudden changes in the variance of returns in each market and how long the shift lasts. They found that most events tend to be local and include the Mexican peso crisis, periods of hyperinflation in Latin America, the Marcos-Aquino conflict in the Philippines, and the stock market scandal in India. The October 1987 crash is the only global event during the period 1985-1995 that caused

a significant jump in the volatility of several emerging stock markets. Sheng and Tu (2000) used cointegration and variance decomposition analysis to examine the linkages among the stock markets of 12 Asia-Pacific countries, before and during the period of the Asian financial crisis. The test show no cointegrational relationship before the period of the financial crisis, and one cointegrational relationship among the national stock indices during the period of the financial crisis. In addition, Granger's causality test suggests that US still causes some Asian countries during the period of crisis, reflecting the US market's persisting dominant role.

In recent years, new equity markets have emerged in Asia, Latin America, Europe, Africa and the Middle East. The correlations of these equity returns are unknown for some markets. Nevertheless, a few studies have investigated the relationships among MENA stock markets. Ratanapakorn and Sharma (2002) investigates the relationships among stock indices of the US, Latin America, Europe, Asia, and Eastern Europe-Middle East for the pre-Asian crisis period and during the crisis period. The authors compare the findings of these two periods to learn if any meaningful changes occurred during the crisis period. They perform cointegration analysis, Granger causality test, and accounting analysis. In addition, they examine the impact of regional and global crises on the US economy. The study used daily regional stock indices for 10 years. They find no long-term relationship before the pre-Asian crisis, and one significant cointegrating vector is observed during the crisis period and each market contributed significantly to the long-run relationship. During the crisis, only European Market Granger causes the US market. The direction of causality markets indirectly cause the US market via the European market. The direction of causality for the whole

system implies that the Asian crisis spread to either Latin American or Eastern Europe-Middle East markets, then to Europe and to the US market. Events such as Gulf War, Japanese stock market decline, and Mexican peso crisis do not have powerful impacts on other regional markets.

Just in the last few years, studies about MENA relationship have been presented. While MENA have low markets returns correlation with world market (Eib, Harvey and Viskanta 1996), Griard, Omran, and Zaher (2003) have found that MENA markets are highly segmented based on relationship investigations between market risk premium and time-varying covariance. Shachmurove (2005) used vector auto regression and Bayesian vector auto regression to investigate how a shock in one market is transmitted to other markets using daily returns of stock market indices in the Middle East and US. The author used daily stock market price indices for Egypt, Israel, Jordan, Lebanon, Morocco, Oman, Turkey and US from October 1996 to September 1999. The author concludes that no stock market is found to be completely isolated and independent, and dynamic linkages indicate that these linkages are relatively small.

Hassan (2003) used multivariate cointegration to test for the existence of long-term relationships between stock prices in GCC countries. Also investigates the short-term dynamics of prices by testing the existence and direction of Granger causality. The author used weekly indices from October 1994 to August 2001 for Kuwait, Oman, and Bahrain stock markets. The study finds that prices in Kuwait and Bahrain are cointegrated with one vector, which means that existence of stable meaningful long-term relationship between indices in these two countries. In the short-term, stock prices are not adjusting to changes in each other, but moving along the trend values.

IV.3. DATA AND METHODOLOGY

The data used are daily closing prices of 12 MENA indices stock markets. The exchanges were located in Bahrain, Egypt, Jordan, Kuwait, Lebanon, Morocco, Oman, Qatar, Saudi Arabia, Tunisia, Turkey and UAE. We also use equally weighted average return for North Africa, Levant, and GCC regions.

The prices were obtained from Global Finance Data. I will examine local daily market indices for six years, from January 3, 1999 to December 31, 2004. Table 5.1 shows the indices and number of observations for each market.

[INSERT TABLE 5.1 HERE]

Indices form MENA 12 markets are used to obtain returns for the 12 markets. Calculating the returns, R_{it} for each of the 12 countries from January 1999 to December 2004 are as follows:

$$R_{it} = \ln\left(\frac{P_{it}}{P_{it-1}}\right) \tag{5.1}$$

where P_{it} is the closing price for each country's index i at time t.

The State Space Procedure

We utilize the state space procedure to test for the best (in the Granger causality sense) relationship among the above variables. The state space procedure is a relatively new econometric approach to examining causal relationships. The procedure has two important attributes found lacking in similar methodologies. One advantage is that the state space procedure makes no a priori assumptions about variable relationships, but relies upon the data in identifying causal relationships. Stated differently, the procedure allows us to test hypothesized relationships without imposing a structural model on the

data prior to estimation. In contrast, autoregressive moving average (ARMA) and vector autoregressive moving average (VARMA) models developed by Tiao and Box require the researcher to tentatively specify the model before estimation. As compared to the state space procedure, VARMA is unnecessarily restrictive when the direction of causal relationships is uncertain.

A second advantage of the procedure is that it can be used to obtain the minimum number of parameters necessary to span the state space of the time invariant linear relationship which best describes a given set of observations. In other words, state space models are parsimonious. Additionally, Watson (1989) argues that, in state space modeling, the constraint that the model places on the data are transparent. He also asserts that in state space modeling, an algebric solution to the model is unnecessary since the model is easily solved recursively by Kalman filter. Aoki and Havenner (1989) maintain that the state space modeling is superior since there is no need for the judgmental model-selection rules employed by other methods (e.g. ARMA).

IV.4. EMPIRICAL RESULTS

Descriptive statistics for each series' daily returns are presented in Table 5.2. Mean, median, maximum, minimum, standard deviation, skewness (the chance of an unexpected large positive negative movement in returns), kurtosis (the likelihood of big positive or negative returns), Jarque-Bera tests (test of normality), the probability of Jarque-Bera test, ADF test (test of unit root), and number of observations.

[INSERT TABLE 5.2 HERE]

The descriptive statistics for MENA stock indices shown in Table 5.2 suggest that Turkey offer on average the highest returns over the sample period of 0.15%, at the same time Turkey has the highest risk as approximated by standard deviation with 3.14%. The highest median return is Kuwait and Turkey. Skewness value is mixed between positive and negative[17]. The highest positive skewed is UAE and the negative found in Bahrain. This means that there is a high probability for investors to get positive returns from UAE rather than negative returns. Furthermore, the kurtosis values of all indices returns are larger than three the value of normal distribution[18]. This is indicates that the indices returns have peaks relative to the normal. In addition, all indices exhibit significant departures from normality as implied by the Jarque-Bera statistics that reject the null hypothesis of normal distribution for returns series[19]. The Augmented Dickey-Fuller (ADF) test was conducted to check for unit root in the variables to determine whether they need to be transformed before models estimation[20]. All indices returns are stationary and we reject the null hypothesis of a unit root.

[INSERT TABLE 5.3 HERE]

Table 5.3 shows the correlation values between the daily returns for the MENA stock markets. Table 5.3 has four panels for GCC, Levant, North Africa, and for regions

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[17] Skewness is a measure of asymmetry of the distribution of the series around its mean. Positive skewness means that the distribution has a long right tail and negative skewness implies that the distribution has a long left tail.

[18] Kurtosis measures the peakedness or flatness of the distribution of the series. The kurtosis of the normal distribution is 3. If the kurtosis exceeds 3, the distribution is peaked relative to the normal; if the kurtosis is less than 3, the distribution is flat relative to the normal.

[19] Jarque-Bera is a test statistic for testing whether the series is normally distributed. The test statistic measures the difference of the skewness and kurtosis of the series with those from the normal distribution. Under the null hypothesis of a normal distribution, the Jarque-Bera statistic is distributed as χ^2 with 2 degrees of freedom. The reported probability is the probability that a Jarque-Bera statistic exceeds the observed value under the null hypothesis; a small probability value leads to the rejection of the null hypothesis of a normal distribution.

[20] The null hypothesis in ADF test is that there exists a unit root in the time series (nonstationary). The null hypothesis is rejected if ADF statistic is greater then the Mackinnon critical values.

rather than countries. One may note a few interesting phenomena. First, all correlations (except Kuwait and Saudi Arabia, 0.113) are low between 0.083 and -0.022. Second, not only are some of the correlations are low, some are also negative, further indicating the ability to benefit from portfolio diversification. A portfolio, which will include stocks from these markets, will have a lower covariance; thus, it will reduce a given return risk faced by international investor. Finally, the most significant correlations between markets can be found in GCC region. In addition, GCC region have significant correlation with the Levant and North Africa.

IV.4.A. THE STATE SPACE ESTIMATES (North Africa)

We begin by analyzing each time series separately and checking for non-stationarity. None of the variables utilized in this study exhibit non-stationarity.[21]

The methodology for constructing state space models consists of three steps. The first step requires that a multivariate autoregressive (AR) model with k lags (AR(k)) be fit. We use the Akaike Information Criterion (AIC) with k=1,...10 to find a definitive starting point for the Yule-Walker equations.[22] Because the smallest AIC (-41350.2) occurs at lag one we opt for an initial autoregressive model approximation with k=1.

In the second step, we employ canonical correlation analysis in developing a general Markovian or state space representation of our AR(1) model.[23] Our initial

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[21] We find that the characteristic roots of the transition matrix for each variable are less than one and hence, the necessary and sufficient conditions for series stability are met.

[22] The Akaike Information Criterion considers the relationship between k-lags in the initial Yule-Walker equations, where k=1,...n, and the resulting autocovariances in selecting an optimal starting point for the initial sample period [See Akaike (1976)]. The optimal k-lag structure is that which minimizes the equations' prediction error relative to the number of parameters used.

[23] Following Tatsuoka (1971) and Akaike (1974), we develop a Markovian representation of the multivariate stochastic system by: (1) producing a revised Yule-Walker equation by adding a moving average term to the initial equation and (2) examining the canonical correlation between the revised

measurement equation relates an *m* x *1* state space vector, ς_t, to the multivariate time series, $\mathbf{y}_t$:

$$\mathbf{y}_t = \mathbf{H}_t\varsigma_t + \mathbf{d}_t + \omega_t\varepsilon_t \quad t=1,..,T \qquad (5.2)$$

where $\mathbf{H}_t$ is an *n* x *m* matrix, $\mathbf{d}_t$ is an *n* x *1* vector, $\mathbf{H}_t$ is an *n* x *n* transition matrix and ω_t is an *n* x *1* vector of serially uncorrelated disturbances, $E(\varepsilon_t) = 0$.

While the state vector ς_t spans the time series, the distributional properties of $\mathbf{y}_t$ are largely unknown, making parameter estimation difficult. Some such properties may, however, be ascertained by decomposing the state vector's prediction error. In the third step of the methodology, we use the Kalman filter (i.e., forward recursion algorithms) to compute the one-step-ahead prediction error, ω_t, and its corresponding covariance matrix. This information is used in constructing an appropriate likelihood function (see Diebold (1989) for a more complete discussion of this approach). Maximum likelihood estimation (MLE) is then used to derive final parameter estimates for the state space model. We converted the state space estimates to VARMA form to facilitate interpretation of the results. The VARMA form results are shown in Table 5.4.

[INSERT TABLE 5.4 HERE]

Equation (1) indicates that the Egypt stock market is autocorrelated and is not influenced by lagged returns of Tunisia and Morocco. Equation (2) also indicates that

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equation and its Markovian representation to determine whether the moving average term adds to the state vector's explanatory power. This process continues until the incremental value of the canonical correlate is zero, indicating that the added moving average term contributes no additional explanatory ability to the model. Bartlett's chi-square is used to test the significance of the relationship between the first canonical correlate and the Markovian representation of the multivariate stochastic system. All subsequent tests employ Bartlett's incremental chi-square.

Tunisia's stock market returns is autocorrelated at lag one while the coefficients for lagged returns of Morocco and Egypt are insignificant. Equation (3) reveals that the daily Morocco stock return is highly autocorrelated at lag one and is not influenced by Egypt or Tunisia stock returns. In summary, we find no causality or spillover from one country to another in the North Africa region.

IV.4.B. THE STATE SPACE ESTIMATES (Levant)

As described in the previous section, we use the Akaike Information Criterion (AIC) with k=1,...10 to find a definitive starting point for the Yule-Walker equations. Because the smallest AIC (-37079) occurs at lag one we opt for an initial autoregressive model approximation with k=1. The converted to VARMA state space model for the Levant region is presented in Table 5.5.

[INSERT TABLE 5.5 HERE]

Equation (1) in Table 2 indicates that Turkey's stock market is autocorrelated at lag one and is also influenced by the Lebanon's stock market from the previous day closing. Equation (2) indicates that the Lebanon's stock market is influenced by the Turkish stock market at lag one. Finally, Equation (3) indicates that Jordan's stock market is not affected by either Turkey or Lebanon stock markets. Our result for the Levant region reveals that there are linkages between stock market in this region. This in quite interesting since we could not find interaction among countries in the North Africa region, while we document linkages in the Levant region. Shachmurove (2005) tested linkage among Egypt, Jordan, Lebanon, Morocco, Oman, and Turkey and find small

dynamic linkages among them involving 15 lags. However, the author used relatively old data from 10/22/96 to 09/30/99.

IV.4.C. THE STATE SPACE ESTIMATES (GCC)

Once again, we use the Akaike Information Criterion (AIC) with k=1,...10 to find a definitive starting point for the Yule-Walker equations. Because the smallest AIC (-85952.9) occurs at lag five, we opt for an initial autoregressive model approximation with k=5. The converted to VARMA state space model for the GCC region is presented in Table 5.6.

[INSERT TABLE 5.6 HERE]

Equation (1) indicates that Saudi Arabia's stock market is influenced by UAE at lags one and two and Qatar. This is quite intriguing since Saudi Arabia is a much larger equity market in terms of capitalization than UAE (157.3 billion dollars vs. 44.6 billion dollars). Equation (2) indicates that Oman's equity market is influenced by Saudi Arabia and UAE at lags one and two. The reported results for Kuwait (Equation (3)) indicates that Kuwait's stock market is also affected UAE. The equity market in UAE leads the Kuwaiti's stock market by two days. The results for Bahrain are not different than the results for Saudi Arabia, Oman, and Kuwait (Equation (4)). UAE leads Bahrain by two days. Equation (5) indicates that UAE's equity market is not influenced by any other market in the region and the market return is autocorrelated at lags one and two. Finally, Equation (6) indicates that Qatar's stock market is not affected by any country in the region except UAE and UAE's stock market leads Qatar's stock market by up to three days.

Hassan (2003) find that stock prices in Kuwait and Bahrain are cointegrated with one cointegrating vector, which means relationship between stock prices in these two countries. Hammoudeh and Choi (2004) reports that movements of GCC returns move in the same direction, suggesting that they commoved by a common factor such as political stability, or oil price. They find the highest movements are between Kuwait and Bahrain, and Bahrain and UAE, which makes these markets the least candidates for portfolio diversification among the GCC markets. We did not find a supporting evidence of relationship between Kuwait and Bahrain. However, the difference between the two studies and this study is they used weekly data from 1994 to 2001. While this study uses daily data from 1/1999 to 12/2004.

The results reported in this section show that there is more interaction and linkage in the GCC region than North Africa and Levant regions. The surprising result here is that UAE's stock market leads all the markets in this region. The UAE's equity market grew (in terms of capitalization) from 2001 to 2003 by 566% while Kuwait' grew at the rate of 223% and Saudi Arabia growth was 214%. The pronounce influence of UAE on other equity markets in the region is intriguing and needs further investigation.

IV.4.D. THE STATE SPACE ESTIMATES (Regions)

In this section, we analyze linkages among the three regions in our study (North Africa, Levant, and GCC). Daily stock returns for each region is constructed by calculating weighted average of the rate of return for each country in that region. The results are reported in Table 5.7.

[INSERT TABLE 5.7 HERE]

Equation (1) indicates that the Levant region is influenced by GCC. In other words, GCC leads the Levant region by one day. Equation (2) reports that the North Africa region is influenced by GCC region. GCC leads the North Africa region by up to two days. Equation (3) indicates that GCC is slightly influenced by North Africa and the market in this region is autocorrelated up to two lags. In summary, we observe linkages among this region. In particular, GCC influences the other two regions. One explanation for the dominance of GCC region could be the sheer size of this region relative to the other two regions. GCC is roughly 25 times bigger than the Levant region and 7 time bigger than the North Africa region in terms of capitalization.

IV.5. CONCLUSIONS

In this chapter, we investigate linkages and interaction within and among the three regions in our study. We find no causality or spillover from one country to another in the North Africa region.

Our results for the Levant region reveal that there are linkages between stock market in this region. We find that there is bi-directional causality between Turkish and Lebanese stock markets while Jordan's market is not influenced by either. The results for the GCC region show that there is more interaction and linkage in the GCC region than North Africa and Levant regions. The unexpected result is that UAE's stock market leads all the markets in this region. In the absence of a better explanation, we contribute this to the tremendous growth of the UAE's equity market. The dominance of UAE on other equity markets in the region is intriguing and needs further investigation.

Finally, we investigate linkages among the three regions. We find that GCC influences the other two regions. We contribute the dominance of GCC region to its sheer size relative to the other two regions.

Table 5.1. The Indices, from January 3, 1999 to December 31, 2004, and number of daily observation.

Country	Index[1]	Observation
Bahrain	Bahrain BSE Composite Index	1474
Kuwait	Kuwait SE Index	1474
Oman	Muscat Stock Market General Index	1474
Qatar	Qatar SE Index	1474
SA	Saudi Arabia SE Index	1474
UAE	United Arab Emirates SE Index	1474
Jordan	Jordan AFM General Index	1454
Lebanon	Beirut Stock Exchange Index	1454
Turkey	Istanbul SE IMKB-100 Price Index	1454
Egypt	Cairo SE EFG General Index	1483
Morocco	Morocco Casablanga All-share Index	1483
Tunisia	Tunisia Indice BVM	1483
GCC[2]		1440
Levant		1440
North Africa		1440

(1) The source of the data is from Global Finance Data.

(2) For each region, I calculate an equally weighed index that reflects the countries in each region.

Table 5.2 Descriptive Statistics for each daily return series

Statistics	Bahrain	Kuwait	Oman	Qatar	SA	UAE	Jordan	Lebanon	Turkey	Egypt	Morocco	Tunisia	GCC	Levant	North Africa
Mean	0.02%	0.10%	0.02%	0.11%	0.12%	0.06%	0.06%	-0.02%	0.15%	0.07%	-0.01%	0.05%	0.07%	0.06%	0.03%
Median	0.01%	0.11%	-0.01%	0.06%	0.08%	0.01%	0.03%	0.00%	0.11%	0.00%	-0.01%	0.00%	0.06%	0.04%	0.03%
Maximum	3.19%	3.85%	6.80%	15.49%	9.77%	4.02%	4.10%	6.02%	17.77%	13.58%	4.46%	5.14%	2.48%	5.60%	3.73%
Minimum	-4.58%	-4.78%	-4.67%	-15.83%	-6.95%	-2.36%	-4.21%	-5.53%	-19.98%	-6.77%	-6.82%	-4.53%	-2.87%	-6.35%	-3.36%
Std. Dev.	0.51%	0.79%	0.74%	2.12%	1.05%	0.52%	0.79%	1.19%	3.14%	1.63%	0.66%	0.92%	0.47%	1.16%	0.68%
Skewness	-0.71	-0.52	1.38	-0.21	0.07	1.42	0.11	0.30	0.13	0.46	-0.08	0.37	-0.17	0.04	0.01
Kurtosis	12.35	7.92	16.32	25.49	15.81	12.84	6.16	6.17	7.05	7.32	17.18	5.85	10.16	5.20	4.46
Jarque-Bera	5497.4	1555.8	11361.5	31089.0	10077.3	6450.9	609.1	632.6	998.9	1204.4	12424.1	536.8	3085.9	290.9	127.5
Probability	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ADF I(0)Test*	-34.49	-32.97	-27.43	-57.36	-39.25	-25.73	-31.50	-34.71	-38.00	-31.71	-27.07	-29.09	-41.64	-36.43	-30.05
Observations	1474	1474	1474	1474	1474	1474	1454	1454	1454	1483	1483	1483	1440	1440	1440

* The ADF Test is Augmented Dickey-Fuller Unit Root, that test of stationary. The critical values for 1% level is -3.43459

Table 5.3 Correlation Matrix of daily market return series. Significant level reported in parentheses (Pearson).

Panel A: GCC region

	Bahrain	Kuwait	Oman	Qatar	SA	UAE
Bahrain	1					
Kuwait	0.028	1				
	(0.287)					
Oman	0.044*	0.074***	1			
	(0.089)	(0.004)				
Qatar	0.047*	-0.006	0.013	1		
	(0.073)	(0.827)	(0.621)			
SA	0.006	0.113***	0.046*	-0.022	1	
	(0.815)	(0.000)	(0.078)	(0.400)		
UAE	0.053**	0.068***	0.027	0.027	0.043*	1
	(0.042)	(0.009)	(0.298)	(0.305)	(0.097)	

Panel B: Levant region

	Jordan	Lebanon	Turkey
Jordan	1		
Lebanon	0.056**	1	
	(0.032)		
Turkey	0.042	-0.028	1
	(0.108)	(0.286)	

Panel C: North Africa region

	Egypt	Morocco	Tunisia
Egypt	1		
Morocco	0.083***	1	
	(0.001)		
Tunisia	0.051*	-0.003	1
	(0.050)	(0.898)	

Panel D: Between regions

	GCC	Levant	North Africa
GCC	1		
Levant	0.050*	1	
	(0.057)		
North Africa	0.066**	0.038	1
	(0.013)	(0.154)	

*** Correlation is significant at the 0.01 level.
** Correlation is significant at the 0.05 level.
* Correlation is significant at the 0.10 level.

TABLE 5.4
State Space Estimates of Linkages Among North Africa Region

(1) $Egypt_t = 0.191\ Egypt^*_{t-1} - 0.008\ Tunisia_{t-1} + 0.653\ Morocco_{t-1} + \eta_{1,t}$

(2) $Tunisia_t = 0.020\ Egypt_{t-1} + 0.272\ Tunisia^*_{t-1} - 0.013\ Morocco_{t-1} + \eta_{2,t}$

(3) $Morocco_t = -0.007\ Eygpt_{t-1} - 0.001\ Tunisia_{t-1} + 0.338\ Morocco^*_{t-1} + \eta_{3,t}$

Notes
* indicates that result is significant at the 1 percent level
** indicates that result is significant at the 5 percent level

Egypt = the rate of return on Egypt stock market
Tunisia = the rate of return on Tunisia stock market
Morocco = the rate of return on Morocco stock market

TABLE 5.5
State Space Estimates of Linkages Among Levant Region

(1) $Turkey_t = 0.019\ Turkey^{*}_{t-1} - 0.133\ Lebanon^{*}_{t-1} + 0.118\ Jordan_{t-1} + \eta_{1,t}$

(2) $Lebanon_t = 0.020\ Turkey^{**}_{t-1} + 0.09\ Lebanon^{*}_{t-1} - 0.010\ Jordan_{t-1} + \eta_{2,t}$

(3) $Jordan_t = 0.007\ Turkey_{t-1} - 0.018\ Lebanon_{t-1} + 0.194\ Jordan^{*}_{t-1} + \eta_{3,t}$

Notes

* indicates that result is significant at the 1 percent level
** indicates that result is significant at the 5 percent level

Turkey = the rate of return on Turkey stock market
Lebanon = the rate of return on Lebanon stock market
Jordan = the rate of return on Jordan stock market

TABLE 5.6
State Space Estimates of Linkages Among GCC Region

(1) $SA_t = -0.568\ UAE^{*}_{t-1} + 0.028\ Qatar^{**}_{t-1} + 1.409\ UAE^{*}_{t-2} + \eta_{1,t}$

(2) $Oman_t = -0.453\ UAE^{*}_{t-1} - 0.0518\ SA^{*}_{t-1} + 0.300\ Oman^{*}_{t-1} + 1.284\ UAE^{*}_{t-2} + \eta_{2,t}$

(3) $Kuwait_t = -0.367\ UAE^{*}_{t-1} + 0.120\ Kuwait^{*}_{t-1} + 1.119\ UAE^{*}_{t-2} + \eta_{3,t}$

(4) $Bahrain_t = -0.340\ UAE^{*}_{t-1} + 0.081\ Bahrain^{*}_{t-1} + 1.055\ UAE^{*}_{t-2} + \eta_{4,t}$

(5) $UAE_t = -0.292\ UAE^{*}_{t-1} + 1.238\ UAE^{*}_{t-2} + \eta_{5,t}$

(6) $Qatar_t = -0.211\ UAE^{*}_{t-1} - 0.619\ Qatar^{*}_{t-1} + 6.610\ UAE^{*}_{t-2} + -0.823\ UAE^{*}_{t-3} + \eta_{6,t}$

Notes

* indicates that result is significant at the 1 percent level
** indicates that result is significant at the 5 percent level

SA = the rate of return on Saudi Arabia stock market
Oman = the rate of return on Oman stock market
Kuwait = the rate of return on Kuwait stock market
Bahrain = the rate of return on Bahrain stock market
UAE = the rate of return on UAE stock market
Qatar = the rate of return on Qatar stock market

TABLE 5.7
State Space Estimates of Linkages Among Regions

(1) $Levant_t = .371\ GCC^*_{t-1} + \eta_{1,t}$

(2) $North\ Africa_t = 0.070\ GCC^*_{t-1} + 0.212\ North\ Africa^*_{t-1} + 0.301\ GCC^*_{t-2} + \eta_{2,t}$

(3) $GCC_t = -0.028\ North\ Africa^*_{t-1} + 0.807\ GCC^*_{t-1} + 0.132\ GCC^*_{t-2} + \eta_{3,t}$

Notes
* indicates that result is significant at the 1 percent level
** indicates that result is significant at the 5 percent level

Levant = the rate of return on equally weighted stock markets in Levant region
North Africa = the rate of return on equally weighted stock markets in North Africa region
GCC = the rate of return on equally weighted stock markets in GCC region

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